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## Summary of Military Manpower Market Research Studies: A Technical Report

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## FOREWORD

As part of the Defense Manpower Data Center's charter to develop an integrated market research base, the Human Resources Research Organization (HumRRO) contracted to identify and synthesize military market research conducted over the last 15 years. The work performed under the contract (MDA903-89-C-0257) summarized relevant research to date, and provided information on using market research efforts more efficiently. The project involved four major activities: 1) meeting with Service and Office of the Secretary of Defense (OSD) points-of-contact to gather reports on OSD and Service-sponsored market research; 2) identifying relevant studies and preparing annotated bibliographies that included study objectives, major content categories, methodologies, data bases, and major findings; 3) conducting a workshop with representatives from the Services' recruiting and research communities; and 4) synthesizing findings.

Three products were generated under the study: 1) A technical report, FR-PRD-91-08, documenting and synthesizing the results of market research conducted under military auspices; 2) A compendium of annotated abstracts of military manpower market research studies, FR-PRD-91-09, available from the Market Research Branch of the Defense Manpower Data Center (DMDC); and 3) A management report, FR-PRD-91-10, which provides recommendations to decisionmakers regarding the design, management, and application of military manpower market research.

The authors wish to acknowledge the support of many persons within the Department of Defense who contributed greatly to the project. Professionals from the Defense Manpower Data Center; the Office of the Assistant Secretary of Defense (Force Management and Personnel) (OASD/FM&P); OSD Comptroller; and the OASD for

Program Analysis and Evaluation; members of the Service policy staffs; and recruiting and advertising managers within each of the Service's recruiting organizations participated in extensive interviews with the HumRRO staff, and provided valuable observations and insight to this effort. The team particularly wishes to thank Ms. Elaine Sellman, contract monitor, and Dr. Jerome Lehnus from DMDC. Ms. Sellman's help in obtaining relevant data and gaining access to key personnel, and her guidance to the project staff were invaluable to the completion of this endeavor. We would also like to thank Dr. Michael Benedict of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) for his review of chapter two.

The members of the Joint Market Analysis Research Committee (JMARC) executive committee provided their time and expertise in reviewing and supplementing the list of candidate studies for inclusion in the project literature. We appreciate their efforts on behalf of the work.

Within HumRRO, Mr. Jeffrey Barnes, Mr. Jack Dempsey, Dr. Deirdre Knapp, and Dr. Connie Schroyer prepared the technical reviews and were primarily responsible for developing the findings and recommendations. Mr. Pat Lerro served as Project Director, and along with Dr. Brian Waters served as a critical reader of the manuscript. Ms. Emma James deserves special accolades for the typing, formatting, and editing documentation.

The opinions expressed in this report are those of the authors and do not represent Department of Defense position or policy unless officially documented elsewhere. The authors appreciate the input provided by many sources within DoD; however, they remain responsible for the content of the report.



## **EXECUTIVE SUMMARY**

In the early years of the All-Volunteer Force (AVF), military manpower planners and recruiting managers saw the need to identify and conduct market research studies to support recruiting and sustain the AVF. Transitioning to a large peacetime standing force wholly through volunteers was challenging and complex. Recruiting shifted from a fairly simple mode wherein youth, under pressure of conscription, actively sought out recruiters to a complex mode wherein the Services found themselves in competition for a diminishing pool of youth who had many options and no pressure to lead them to recruiters.

Recruiting managers drew extensively on the tools of private sector marketing to stimulate the supply of volunteers. The literature on the relative contributions of advertising and a sales force (when marketing an intangible, high-risk, once-purchased product) influenced the structure of the military recruiting effort. Planners borrowed from private sector marketing theory, practice, and expertise. The rudiments of a military market research program began to examine the enlistment decision process and evaluate recruiting and advertising activities.

Over the last two decades, military planners have used increasingly more sophisticated market research techniques to better understand market conditions, competitive dynamics, and the desires of prospective recruits. Office of the Secretary of Defense (OSD) and the Military Services examined the supply and demand sides of the marketplace; the relationship between them; the impact on supply of changes within the monetary and non-monetary aspects of the product; demographic and psychographic (or lifestyle) patterns of various segments of the marketplace; quantitative and qualitative communications research; and comparative performance between the Services.

There is no doubt that market research has made a major contribution to military recruiting success. This project has highlighted the level of effort, particularly on the part of the Army, to gather market information. The research has been high quality. Most recommendations, therefore, focus on more global issues about the body of research as a whole and on directions for future work.

The Market Research Branch of the Defense Manpower Data Center (DMDC) desired a comprehensive literature review of military manpower market research findings. The object was to capture the essence of the range of work done to date; to make use of the large, and currently disaggregated, archives of market research data; and to provide recommendations.

Studies screened were classified into one of three major groupings: Understanding the Market, Identifying the Market, or Influencing the Market. The three were further divided into 17 subcategories. Abstracts of more than 1,000 studies were scanned. From these, 225 studies were reviewed, focusing on the breadth of knowledge in these studies as opposed to an in-depth review of a few. The results of the synthesis were presented in September 1990 to a workshop, which included 35 participants representing Service recruiting commands, research offices, policy staff, and DMDC. The results of the literature

review and the workshop, and their implications, comprise this technical report. The following paragraphs summarize the literature from the three major categories.

### Understanding the Market

The primary method for market-related research devoted to understanding enlistment-age youth has been surveys. Surveys measured enlistment propensity, motivations, attitudes, qualifications, and demographic characteristics of youth. They also tapped knowledge and perceptions of Service benefits, awareness of Service advertising, and the levels of contact with recruiters. The focus of studies was on youth who are categorized as "high quality" (i.e., high school diploma graduates who achieve a score at or above the 50th percentile on the Armed Forces Qualification Test [AFQT]).

Most surveys provided information related to (a) enlistment propensity, (b) the motivating factors considered most important by youth, (c) market segmentation, and (d) youth media habits and awareness of military advertising. Propensity was between 12-20 percent, usually falling at the lower end of the spectrum. It was shown to be stable across years, although propensity differed toward particular Services. Differences were found when considering gender, race, educational aspirations, and estimated quality of surveyed youth. The summation of survey reports indicate, for example:

- Non-high school graduates had higher propensity to enlist than did high school graduates.
- Propensity increased as high school grades decrease.
- Men had higher propensity than women.
- Blacks had higher propensity than whites; however, as the estimated aptitude scores of blacks increased, their propensity declined at a steeper rate than other racial/ethnic groups.
- As age increased from 16 to 21, propensity decreased.
- There was a curvilinear relationship between predicted AFQT and propensity (low AFQT corresponds to low propensity; as AFQT rises, propensity rises, but only up to an estimated AFQT of 55 -- after 55, the propensity begins to decline).
- Those unemployed, but looking for work, had higher propensities than those employed, but those unemployed and not looking had the lowest propensity in the three categories.

In short, those with the highest interest in enlisting were not necessarily the applicants sought by the military. In addition, studies consistently showed a fairly strong relationship between propensity and enlistment behaviors, even after controlling for effects of demographic variables. Propensity was found to predict test-taking behaviors as well as actual enlistment in the Services.

In regard to the motivations and attitudes of youth, the surveys identified consistent goals, or values considered important to youth. Those ranked highest by youth include:

- Developing one's full potential.
- Having a secure future.
- Having a job of which one could be proud.
- Living/working in a stable environment.
- Being respected by family and friends.
- Being prepared to work in a high-tech environment.
- Obtaining a useful skill.
- Being able to meet physical and mental challenges.

In regard to advertising awareness and media habits, the surveys indicated that while youth spend twice as much time listening to the radio as compared to TV, and seven times more than reading magazines, TV and magazine ads had higher recall percentages than radio. The surveys also showed differences in advertising awareness and media habits by age, AFQT scores (both estimated scores derived in the Youth Attitude Tracking Studies [YATS] and the Army Communications Objectives Measurement System [ACOMS] Study, and actual scores derived from New Recruit Surveys), and ethnicity.

The relationship between awareness and perceptions was significant. Those who recalled specific Service advertising were more familiar with Service offerings; those who were familiar with Service offerings generally had a more positive perception of that Service.

### Identifying the Market

Without conscription, the Services had to compete directly with the private sector and post-secondary schools for bright young recruits. Justifying recruiting programs and resources required models that quantified the impact of economic and other variables on the supply of enlistments. In what were known as enlistment supply studies, analysts estimated

mathematical relationships between the number of enlistments (accessions or contracts) and a variety of explanatory variables.

Models of enlistment supply were developed within an economic framework. That is, it was assumed that individuals compare work in the military with work in the private sector, and select the one that maximizes economic benefits. Examples of supply factors used are relative military compensation (the ratio of civilian wages to military compensation that includes pay, tax advantages, and subsistence), youth population, unemployment, and recruiting effort. Enlistment supply models were developed using econometric regression-based techniques. These techniques ranged from simple ordinary least squares (OLS) regression using aggregate, cross-sectional data to more sophisticated stochastically-linked switching regressions designed to account for supply-demand constrained functions, simultaneity bias, and autocorrelation.

Enlistment supply studies had four main purposes: (1) production of long-term forecasts (5-7 years) of enlistment contracts or accessions, (2) computation of economic elasticities of variables affecting the enlistment decision, (3) quantitative insights into resource allocations, and (4) short-term forecasts (up to 12 months) to forewarn of impending supply/demand disequilibrium which would necessitate policy changes.

Researchers employed the concept of elasticity when reporting supply effects. The elasticity of supply of a factor is the percentage change in enlistments for a one percent change in the factor. Supply studies showed wide variations in the type of data, explanatory variables, and the functional form of the estimated relationships. Through 1983, studies yielded more questions than answers. While most authors agreed on the direction of effects, there was wide divergence in magnitude. The early work on enlistment supply should be viewed not so much in terms of a synthesis where one tries to bring together divergent views, but in terms what was learned regarding the process of estimating supply. The most important procedural lessons learned were:

- Recruiting accomplishment should be measured in terms of contracts, not accessions.
- It is critical to include appropriate variables. At a minimum, a model should include measures of unemployment, civilian and military pay, and recruiting effort (recruiters and goals).
- The lower the level of data aggregation, the better. Long time series at the recruiting organization level (battalion, district, squadron) provide more stable information.

Learning from its early efforts, over the past 10 years the research community significantly increased the sophistication of its efforts in terms of the numbers and types of independent variables used, the level at which data are collected, and state-of-the-art techniques employed to measure the effects of these variables. There has been a continual strong trend toward increased methodological rigor and more complex specifications. This has resulted in more accurate understanding of business cycles, improved economic

projections, and an increased capability to explore the interactions of economic and demographic variables related to the enlistment decision. Estimates of supply elasticities of Army enlistments obtained from more recent studies have tended to converge. This move toward agreement of results achieved by different authors provides a sound basis for consensus estimates of supply elasticities. Conclusions for the other Services are less precise. Consensus elasticities are shown in the following table.

Table ES-1

Best Estimates of Supply Factor Elasticities\*

<u>Male, High School Graduate, AFQT Cat I-III</u>				
	<u>Army</u>	<u>Navy</u>	<u>Air Force</u>	<u>Marine Corps</u>
<b>Factors</b>				
Pay	1.20	0.83	0.70	0.83
Unemployment	0.59	0.46	0.59	0.48
<b>Recruiters</b>				
Partial	0.31	0.46	0.75	0.48
Total	0.50	0.61	0.90	0.60
ACF* Benefits	0.14			
Enlistment Bonus	----			
Advertising	0.05			

\*ACF = Army College Fund.

\* Adapted from "Recent Estimates of Enlistment Supply Models" by Dr. Larry Goldberg, April 1991, page 36, Table 13.

### Influencing the Market

Much of the success of military recruiting over the past two decades was built on a foundation of research on the factors that influence the market. Studies in this category focused on the impact of programs and resources on producing enlistment contracts.

On the surface, research has quantified the effects of programs that are obvious. Recruiters, advertising, bonuses, terms-of-service, and recruiter aides all increase the supply of high-quality recruits. However, it is the discipline of research methods that guided policy makers in developing effective recruiting programs. In particular, "experiments" to evaluate

programs were invaluable for successful implementations. Experiments typically involved control and treatment cells, and were analyzed using analysis of variance or regression methods. Techniques employed included combinations of econometric and optimization techniques. Experiments showed that various incentives acted to either actually expand the market, or channel youth to skills they normally would not have considered.

Enlistment incentives are an integral part of military recruiting strategy. The typical life-cycle of an incentive program includes development, debate, experimentation, implementation, evaluation, and adjustment. A variety of monetary and non-monetary incentive programs have been studied. Monetary incentives (e.g., Montgomery GI Bill, Army College Fund, and enlistment bonuses) are effective. Non-monetary incentives (e.g., guaranteed job training, shorter terms of enlistment, stations of choice) were also confirmed as powerful and low-cost enlistment options.

### **Recommendations**

After completing the review of studies and considering input received during the September 1990 workshop, a number of recommendations were developed. The following recommendations, sorted by functional design, were made to further strengthen the military manpower market research effort. Market research studies should:

#### **Analytic Process and Approach**

- Describe variable construction and rationale in sufficient detail to be replicated.
- Explain the theoretical model and underlying assumptions from which model specifications and functional forms are derived.
- Describe the rationale for using increasingly complex models and data structures and demonstrate their marginal benefits when compared with simpler formulations.
- Include sufficient statistics to allow thorough evaluation by technical readers.
- Report confidence bands for elasticities and supply projections. Allow for increased uncertainty as the time horizon of projections increases.
- Use more sophisticated statistical techniques (e.g., regression analysis, factor analysis) to understand the underlying dimensions or theory behind the data, as opposed to simply reporting percentages.
- Ensure that researchers make use of a basic set of explanatory variables in future studies of enlistment supply. At a minimum, models should include unemployment, relative pay, recruiters, and missions. In addition, measures of advertising and ACF benefits should be included for Army models.

- Compile and maintain a consistent data set at the basic recruiting organization level and formulate more accurate forecasting models. These data would form the basis for testing new estimation methods or adding new explanatory variables.
- Encourage a multidiscipline approach to allocation research.

#### Research Areas

- Focus on depth rather than breadth of data collection, in contrast to answering all questions in every survey (e.g., restrict the Fall wave of YATS to the vocational decision process, propensity, values, and perceptions; and the Spring wave to media habits and advertising awareness/effectiveness).
- Conduct more subgroup analyses on important market segments (e.g., low-propensity youths, women, minorities, immigrants, and health professionals).
- Conduct more research on the vocational choice decision process, possibly by surveying younger youth.
- Assess the implications of a more structured survey of new recruits as opposed to surveys of the general population.
- Reconsider the place of veteran data in understanding initial enlistment motivations.
- Conduct more focused work on Reserve Component recruiting.
- Aim future advertising research at gaining a better understanding of the roles that advertising plays in communicating to prospective recruits, rather than just measuring the effectiveness of advertising on producing enlistment contracts.
- Analyze impact of inflation on educational and monetary incentives. Specifically, conduct an experiment to test the \$36,000 Army College Fund and the impact of a small (\$1,000-\$3,000), but widely available, enlistment bonus.

#### Applications

- Prepare an executive summary in non-technical language.
- Accelerate reporting and disseminating survey findings.

- Expedite the transition from laboratory to the field. Future work should incorporate sound research with software technology to produce practical recruiting management tools.

## Summary

Reliable and accurate market information has been the basis for military marketing strategy development, pricing, product promotion, and placement of resources. It has aided in setting objectives and provided the analytic basis for meaningful evaluation of marketing programs. Market research has been used to formulate policy, evaluate program effectiveness, design new product offerings (enlistment terms, programs, bonuses, and college funds), and allocate recruiters, goals, and advertising support. It has also provided data to defend recruiting programs in the congressional authorization and appropriations process.

It is critical for DoD to sustain a strong market research effort. The recommendations in this and the project management report should assist DoD and the Services as they strive to enhance recruiting effectiveness in an environment of "do more with less." Valid, current information on the target market is the key ingredient in accomplishing that objective.



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## **Chapter 1**

### **INTRODUCTION**

This report is one part of a study designed to synthesize the body of military market research conducted over approximately the last 15 years. As part of the Defense Manpower Data Center's effort to develop an integrated market research base, the Human Resources Research Organization (HumRRO) identified and synthesized recent military market research. The project involved four major activities: 1) meeting with Office of the Secretary of Defense (OSD) and Service recruiting managers and manpower policy staffs to gather reports on OSD and Service-sponsored market research; 2) identifying relevant studies and preparing annotated bibliographies that included study objectives, major content categories, methodologies, major findings; and evaluations of current utility; 3) conducting a workshop with representatives from the Services' recruiting and research communities; and 4) synthesizing findings.

### **STUDY APPROACH**

There were five steps in the study: 1) searching the literature; 2) interviewing market research users; 3) preparing annotated abstracts for reviewed studies; 4) categorizing and synthesizing study findings; and 5) preparing technical and management reports of findings and recommendations.

## **Literature Search and Interviews**

To develop the initial list of studies to be considered for review, project staff examined existing data base archives (e.g., the Defense Technical Information Center and the Manpower and Training Research Information System), and obtained reports from the Services, the Center for Naval Analyses, RAND Corporation, and individual authors. More than 1,000 studies from the 1973-1988 time period were screened.

The focus in the initial review was upon general relevance to military market research. Studies not selected included those that were better defined by categories other than market research, such as job performance, attrition, enlistment standards, recruiting management, recruiting techniques, and advertising copy research. Also eliminated were outdated studies, or those too shallow, or too narrow in scope to have multi-Service application. Recruiting managers, researchers, policy staff at the recruiting commands, and OSD officials were interviewed to aid in selection and to identify other relevant studies.

A list of candidate studies was provided to each Service. The Service recruiting commands described policy, direction, management, overall purpose, and future needs of their market research programs. They discussed how the project could be most effective, and agreed to participate in a workshop to discuss findings. Approximately 350 studies from the 1973-1988 period were selected for review.

## **Development of a Classification Scheme**

The interview information was used to develop a classification scheme into which to fit the studies. The study team discussed with DMDC and OSD officials a number of

possible classification schemes. Three broad categories were selected:

- Understanding the market
- Identifying the market
- Influencing the market

The studies were then grouped under the following subcategories:

Table 1.1

The Market Research Classification Scheme

---

**I. Understanding the Market**

- A. National Longitudinal Surveys of Youth (NLS)
- B. Army Communication Objectives Measurement System (ACOMS)
- C. Army New Recruit Survey (NRS)
- D. Youth Attitude Tracking Study (YATS)
- E. Army Experience Survey (AES)
- F. Reserve Surveys
- G. Recruiting Specific Populations (minorities, female, older youth)
- H. Individual Enlistment Decision-Making
- I. Miscellaneous Propensity/Incentive Surveys

**II. Identifying the Market**

- A. Enlistment Supply
- B. Market Conditions
- C. Market Segmentation
- D. Goal Allocation

**III. Influencing the Market**

- A. Advertising
    - A-1. Service-Specific Advertising
    - A-2. Joint/Service Advertising and Comparison
  - B. Recruiter Productivity
  - C. Enlistment Incentives
  - D. Production Mix and Resource Allocation
    - D-1. Production Mix
    - D-2. Resource Allocation
-

### **Preparation of Annotated Abstracts**

The 350 studies were reviewed by project staff. Of that group, 225 were selected for inclusion in the synthesizing project and were entered into an abstract data base, using a standard format. Each abstract included study objectives, a description of methodology (e.g., samples and measures used), a summary of results, an assessment of the technical adequacy of the study, and a judgment on the accessibility and usefulness of study findings. The original study abstracts and executive summaries were the primary sources in preparing sections on study objectives, methodologies, and findings. However, each study was read in entirety to verify consistency with the summations. Study characteristics are discussed below.

***Study objectives.*** Listing study objectives provided a context for understanding the study's technical approach and methodology, and how the authors described the results and findings. For example, data may have addressed a specific problem. The same data could also address other issues that were not of interest to the original researchers or study sponsors. This was particularly relevant if the goals of the study were narrowly based.

***Study methodology.*** Where the information was available, the description of the study methodology included (1) sample composition; (2) variables studied; (3) measures used; (4) when and where data were collected; and (5) data analyses conducted.

***Summary of results.*** Only major analyses were included in the summary of results. When available, actual statistics (e.g., correlations) were reported, along with a verbal summary of subgroup analyses such as race and gender.

**Technical adequacy.** The technical adequacy assessment considered (1) representativeness of the sample, (2) psychometric quality of measures, (3) appropriateness of data analyses, (4) rigor of hypothesis testing, if applicable, and (5) soundness of conclusions.

**Evaluation.** The team primarily evaluated accessibility and utility of the study to users. It was assumed that decisions about study acceptability had already been made by the clients in accepting the study results.

During the course of the project, a number of relevant reports published in 1989 or 1990 -- that is, after the period covered by the comprehensive screening -- were added to the cluster of reports that were reviewed and synthesized. A number of reports published before 1973 were also included for historical reasons.

#### **Technical Synthesis and Reporting**

The final steps were to synthesize the reviews of the studies for which abstracts had been prepared, and to document the results. The reviews identified patterns applicable to the majority of studies within each subcategory, and the emerging patterns formed the basis of the synthesis. The patterns were then grouped into findings and issues for discussion.

The findings and issues were the basis for a workshop held in September 1990. The workshop included 35 participants representing recruiting commands, personnel research laboratories, Service and OSD policy staff, and DMDC. Project staff briefed the group on the results of the technical synthesis. Workshop participants commented on



findings, identified possible gaps in research, suggested implications/recommendations for future research, and identified other issues for review.

A package containing an agenda, a working paper, and copies of the abstracts (see Appendix A for titles of the abstracted studies) for each of 17 market research subcategories was sent to each participant prior to the workshop. Presentations summarized the body of knowledge by grouping the studies by category. For each subcategory, a summation was presented along with implications/needs for further research. Discussions followed each presentation on the need for redirection, expansion, or other changes. The information from the interviews, the findings and implications of the technical review of the studies, and feedback from the workshop were used in preparing this technical report and the adjunct management report.

### **ORGANIZATION OF THE REPORT**

The following chapters present the results of the technical review of the body of knowledge within each category. Chapter 2 deals with understanding the market, chapter 3 with identifying the market, and chapter 4 with influencing the market. Chapter 5 presents the recommendations and conclusions that emerged from the project's comprehensive consideration of what market research had accomplished, and might accomplish in the future.

## Chapter 2

### UNDERSTANDING THE MARKET

Market research devoted to understanding enlistment-age youth has primarily used surveys. Analysis of the survey reports showed that they emphasized youth categorized as "high quality" -- that is, high school diploma graduates who achieve a score at or above the 50th percentile on the Armed Forces Qualification Test (AFQT). Table 2.1 identifies the major surveys reviewed in this effort. They include surveys conducted on a recurring basis (e.g., Youth Attitude Tracking Studies [YATS] and New Recruit Surveys [NRS]) as well as one-time studies (e.g., the Army Communications Objectives Measurement System [ACOMS]).

The surveys, in general, measured attitudes, perceptions, consumer habits, life styles, and values of three groups: the youth population at large, the population of enlistees (mostly new recruits, although some surveys examined separating Service members), and specific sets within the general population (e.g., women, minorities, parents).

The Services do not rely solely on the military manpower surveys described in this chapter for psychodemographic data. Through their advertising agencies they also have access to proprietary information on the habits, values, and attitudes of young consumers. The combination of DoD-sponsored surveys, youth market information from Service advertising agencies, and other sources tapped by the Services, provides the Services a wealth of information on the targeted youth market and the general population.

Table 2.1

Summary of Surveys Included in Understanding the Market

STUDY	STUDY DATE	SAMPLE	SPONSOR					MAJOR AREAS OF STUDY
			Army	Navy	Air Force	Marine Corps	DoD	
Army Communications Objectives Measurement System (ACOMS)	1986/87 School Year	16-24 year old youth and parents	X					Army image, dual market, media usage, advertising recall, parental vs. youth perceptions
Army Experience Survey (AES)	1985	Army veterans who left Service from FY82 to FY84	X					Attitudes and experiences of former Army soldiers
A.I.R. ROTC Survey	1979	Freshman and sophomore college students (subgroups - ROTC, non-ROTC, etc.)	X					Attitudes and propensity toward ROTC, media habits, career choices
Army Reserve Market Study	1982	All enlisted personnel in the Army Reserve	X					Attractiveness of Reserve incentives, ease of performing Reserve duty reasons for participation
Army New Recruit Survey (NRS)	1982-1990	Active Army, Reserve, and National Guard new recruits	X					Initial contact with Army, reasons for enlisting, effect of advertising
Career Decision Survey	1987/1988	17-20 year old men and women	X					Career intentions and influences, enlistment related behaviors
College Students Survey (Ted Bates, Inc.)	1981	College sophomore, junior, and senior males between 18 and 24 years old		X				Awareness of Navy officer advertising, attitude toward Navy, effectiveness of on-campus Navy promotional efforts
College Market: SSR Survey	1980	Sophomore, junior, and senior college students					X	Propensity to enter military officer programs, career plans, important job characteristics
Crossley Surveys	1985-1986	17-22 year old males	X					Changes in propensity over a 12-month period; awareness of GI Bill
DoD Survey of Officer and Enlisted Personnel	1985	Active duty military worldwide					X	Reenlistment and Reserve motivations

(Continued)

Table 2.1 (Continued)

Summary of Surveys Included in Understanding the Market

STUDY	STUDY DATE	SAMPLE	SPONSOR					MAJOR AREAS OF STUDY
			Army	Navy	Air Force	Marine Corps	DoD	
Enlistment, NPS and Veterans Questionnaire	1979	NPS and veteran males and females					X	Reserve/National Guard intentions, enlistment related behaviors
Gilbert Youth Attitude	1972	17-21 year old males not currently in college		X				Attractiveness of various incentives
Grey Marketing Study of Market Potential of NPS Females	1979	16-25 year old women with no military experience					X	Female propensity, demographic personality, and lifestyle characteristics
High School Student Attitude Survey; Rumson Corp.	1982, 1985	"Contacts" of Army recruiters and "contacts" who had not yet enlisted	X					MAGNES technique to determine attractiveness of incentive
Male College Students Survey	1980	Undergraduate males of predominantly black or predominantly white colleges		X				Perception of Navy officer career, job/career aspects, information for participation
Market Facts Study of Minority and Female Youth	1982	High School 10th and 11th grade black males, females, and white females from military and civilian families				X		Propensity for military officer career, perceptions of alternative, image of West Point
Marine Corps Awareness and Image Tracking Research	1984-1990 Semi-Annual	16-19 year old unmarried males with no military experience				X		Advertising awareness, media habits, valued attributes
Navy Strategic Study (BBDO)	1988	16-18 year old male focus groups		X				Image of services and persons enlisting in each service; problem detection
National Longitudinal Survey (NLS)	1966-1990 Annual	14-21 year old youth (sub samples of minorities, low income, and military)					X	Work experience, education and training, job and employment information
NPRDC Study of Older Males	1981	23-29 year old males with no military experience		X				Propensity of older males, attractiveness of incentives
Youth Attitude Tracking Study (YATS)	1975-1990 Annual	16-24 year old non-prior service					X	Demographic info; Propensity; values; influences; adv. awareness/recall

## SUMMARY OF RESEARCH FINDINGS FROM SURVEYS

Four common threads were found throughout these surveys. Most of the provided information related to:

- o Measuring the propensity to enlist<sup>1</sup> (propensity to enlist in the military in general, and for specific Services and Service Components) by various subgroups and by other demographic characteristics.
- o Identifying life goals or values considered most important by segments of the youth population, whether they believed they can achieve the goals in the military, and which elements of the military serve as the primary motivators and demotivators when enlistment is being considered.
- o Analyzing data on the market segment that would most probably represent high quality in terms of potential applicants who score in the upper half of the AFQT score distribution (even though Armed Services Vocational Aptitude Battery [ASVAB] scores were not available).
- o Measuring the effectiveness of aspects of recruiting management, such as advertising awareness, recall of advertising messages, and awareness of enlistment offerings.

### Propensity to Enlist

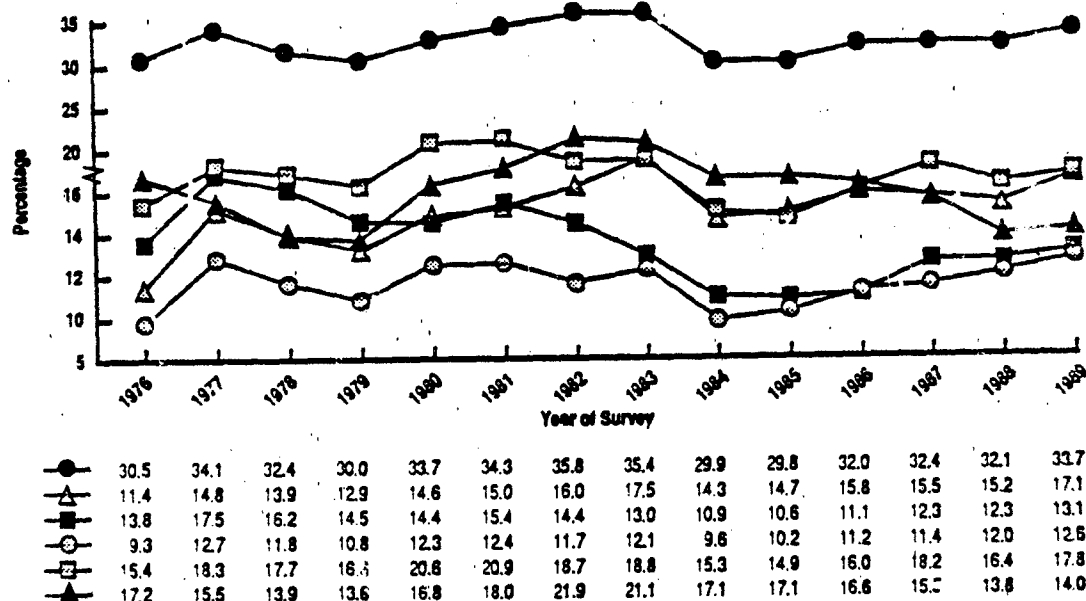
In the early years of the All-Volunteer Force (AVF), researchers and recruiting managers agreed on two points. The first was the apparent relationship between propensity to enlist and unemployment. This argument was used by some critics of the AVF in declaring that the military was an employer of last resort. The second was a consistent result showing that the Air Force was the Service of choice, followed by the Navy, then the Army and Marine Corps. The latter point was a contributing factor for

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<sup>1</sup>Propensity is derived from survey questions that ask how likely it is an individual would join the military or a specific Service Component. Propensity youth are those who say they definitely or probably would join the military; negative propensity youth are those who say they definitely or probably would not join the military.

the Army adding recruiting resources and incentives, and implementing an aggressive advertising program in the early 1980s.

The data supporting these two points are illustrated by Figure 2.1, adapted from the 1989 YATS report. The trend from 1976 to 1980 supported the two points but, starting in 1980, the relationship between unemployment and propensity began to weaken. This change was especially noticeable over the last 5 years. It was clear that other factors also affected propensity and that the Services were not solely employers of last resort.



Note. Estimates prior to 1983 have been reweighted to be comparable to those from 1983 through 1989.

Source. Youth Attitude Tracking Study, 1976-1989.

Figure 2.1 Trends in Positive Propensity and Unemployment 16- to 21-Year - Old Males, 1976 - 1989

Understanding what caused the shifts in Service trends provides a valuable lesson for those who influence recruiting programs and resources. The successes of the Army and, to a lesser degree, the Marine Corps were in large part due to understanding the needs of various segments of the youth market. These two Services used the marketing information to implement creative management initiatives and recruiting programs. They also used data to gain Service leadership, and OSD and Congressional support for the resource levels needed for their programs. The end results have been extremely successful recruiting programs in spite of a tough recruiting environment. On the other hand, lack of market understanding and sufficient resources can result in a steady recruiting decline, as demonstrated by the Navy during the 1981 - 1985 period. The Navy's lowered recruiting resources not only affected propensity, but resulted in the Navy's recruiting lower quality candidates compared with the other Services.

The surveys showed differences in propensity between segments of the population. Synthesis of the reports illustrated that:

- o Non-high school graduates have higher propensity than high school graduates.
- o Propensity increases as high school grades decrease.
- o Men have higher propensity than women.
- o Blacks have higher propensity than whites; however, as the estimated aptitude scores of blacks increase, their propensity declines at a steeper rate than other racial/ ethnic groups.
- o As age increases from 16 to 21, propensity decreases.
- o There is a curvilinear relationship between predicted AFQT and propensity. (Low AFQT corresponds to low propensity; as AFQT rises, propensity rises but only up to an estimated AFQT of 55 -- after 55, propensity begins to decline).

- Those unemployed but looking for work have higher propensities than those employed, but those unemployed and not looking had the lowest propensity of the three categories.

In short, those with the highest propensities were not necessarily the applicants sought by the military. Manpower managers recognized they had to develop programs to overcome the objections of the desired market and to obtain a strong flow of enlistees from lower propensity groups.

Reserve propensity levels were similar to active force propensities (between 9 and 25 percent), although in comparison youth had higher propensity for the active forces. Propensity for the Reserves among prior active duty personnel was higher if there was a belief in supportive civilian company policies regarding Reserve participation.

The importance of measuring and understanding propensity was underscored by many studies (Orvis, 1982, 1984, 1986; Orvis & Gahart, 1985; Orvis, Gahart, Ludwig, & Schutz, 1989; Nord, Schmitz, & Weiland, 1986). RAND Corporation developed a model to predict enlistment behaviors using survey information. Consistent, fairly strong relationships were found between propensity and enlistment behaviors, even after controlling for effects of demographic variables. Propensity generally had a lagged effect, with the greatest predictive power displayed 12 to 18 months after the survey. Propensity predicted test-taking behaviors as well as actual service enlistment. Relationships were also found between propensity and later attrition from the military. The model demonstrated that propensity was generally less effective in predicting enlistment for women.



## **Values, Motivators, and Demotivators**

The Youth Attitude Tracking Study has provided significant annual data about the goals and values of the enlistment-aged market. Even more in-depth information has come from studies commissioned by the Services. The Services and their advertising agencies determine what youth consider important, whether youth believe they can attain their goals in the military, what incentives or offerings serve to attract youth toward enlisting, and what aspects of the Services are least desirable. The surveys also measure youth perceptions of the image of the military in general, and of each Service. Many Service-sponsored surveys were not published but, for this study, information was gathered through conversations with managers and through briefings provided by points of contact within each recruiting command.

The majority of Service survey studies provided fairly rapid input to recruiting managers who determined options, incentives, and approaches to correct perceptions or satisfy youth wants. The survey findings, and subsequently developed packages, also aided advertising managers in designing advertising strategies to communicate the new offerings to youth. Surveys included the Services' new recruit surveys and periodic awareness and attitude studies (e.g., the Marine Corps semi-annual awareness and attitude tracking study, a series of strategic/communications surveys conducted by the Navy, and Army surveys of market segments).

Each Service survey and YATS measured the importance of goals (up to 19 in the Army ACOMS). The surveys identified fairly consistent goals, or values considered important to youth. Those ranked highest by youth include:

- Developing one's full potential.
- Having a secure future.
- Having a job you can be proud of.
- Living/working in a stable environment.
- Being respected by family and friends.
- Being prepared to work in a high-tech environment.
- Obtaining a useful skill.
- Being able to meet physical and mental challenges.

Service studies also measured youth perceptions toward each Service, not just their own. Information from unpublished reports (such as the Navy's Strategic Research Report and the Marine semi-annual awareness and tracking studies), and follow-on analyses of YATS survey data (e.g., Bray et al., 1989) indicate the following images of what each Service offers, and the types of youth who enlist in each:

Army. Youth associate the Army with preparing one for a job in civilian life, career training, and a large variety of jobs. The Army is perceived as most likely to give you the job you want and provide most money for college. Youth also identify the Army with a high probability of being in combat. The typical Army recruit is perceived by youth as blue collar, not stylish, less educated, immature, and a follower. The data support the argument that the Army has the most difficult recruiting mission (and therefore the need for relatively higher levels of resources) in that the lowest percentage of youth identify themselves as fitting their image of Army recruits.

Navy. With the exception of nuclear training and travel, there was no clear delineation of a Navy image. The Navy had the highest negative ratings about separation from family and friends, loneliness, and boring work. Navy recruits were perceived as reserved, less self-confident, and younger. However, more youth associate themselves with this profile than with the Army recruit profile.

Air Force. The Air Force is perceived as the most technically advanced Service, providing the best training in computers and electronics. It is also perceived as the best Service in terms of pay and living conditions. The typical Air Force recruit is perceived as successful, clean-cut, educated and intelligent, upbeat, and confident. Approximately half of surveyed youth believed they fit this image.

Marine Corps. The Marine Corps image is one of toughness, the most elite and most prestigious of the Services, a strong disciplined organization, and highly motivated. Youth identify the Marine Corps with war and probability of combat. The typical recruit image is blue collar, athletic, masculine, macho, and tough. In terms of affinity, more youth identified themselves with this profile than with that of the Navy or Army.

With the exception of the Navy, the images of the Services corresponded to the image they portray in their advertising messages, supporting the effectiveness of advertising. The Navy recognized the image perception problems and, at the time of this report, was actively engaged in designing new programs and advertising strategies.

The specific reasons youth offer when asked what moves them to consider an enlistment vary by subgroups. The most frequently cited reasons were a chance to better oneself, job skill training (including the ability to get a job after the military), money for

education, the opportunity for personal growth, and job security (Pliske et al., 1986). An Office of Naval Research study (Kaplan & Harris, 1983), conducted in high schools, indicated economic reasons (salary and benefits) were the primary reasons youth enlist, followed by skill training and money for education.

The work-oriented target market was more motivated by job skill training, whereas the college-oriented market was more attracted by money for education. This differentiation was based more upon perceived opportunities, rather than differences in basic values of each group. As pointed out in the ACOMS study (Nieva & Elig, 1988), both groups were seeking the same life goals. However, the work-oriented group saw the Army as presenting opportunities to gain desired goals (and therefore, by implication, they had a higher propensity to enlist). Additionally, ACOMS sent a clear warning that the work-oriented group (which was much smaller than the college-oriented group) is not large enough to meet Army numerical requirements. Thus, the Army expanded its market by developing programs to attract both the work-oriented and the college-oriented groups. With information from ACOMS, the New Recruit Surveys, and other attitudinal information, the Army segmented its approach and developed a dual-market strategy with programs and advertising aimed toward both markets.

Enlistment bonuses were given moderate endorsement across studies. Bonuses are offered only to individuals who achieve a certain quality profile, and who are willing to enlist in a limited number of skills for a minimum time period. When offered, combination packages with both educational and enlistment bonuses were generally favored because of the size of the educational incentive. Other tangible incentives found to be good

motivators were guaranteed monthly salary, free medical and dental care, other benefit programs, and choice of duty station.

A number of studies examined enlistment motivations within demographic and quality subgroups. Females were motivated by equal pay and opportunities, the chance to develop potential, getting the job they wanted, or job security (Gray, 1987). Blacks were more likely than whites to desire financial stability and personal satisfaction from their job (Market Facts, 1982). Older males (23-29 years old) were more attracted by training opportunities, patriotism, job security, benefits, and enlistment bonuses than were younger males 17-22 years old (Borack, 1982; Finnessy, 1984).

Other studies examined potential motivators for Reserve and officer target markets. College students, when asked what they would desire in a military officer career, valued job security, personal responsibility, and promotion opportunities. Enlisted bonuses, retirement benefits, and service to country were the most frequently cited reasons for joining the Reserves.

Perceptions that led youth to reject enlistment were primarily related to alternative opportunities, particularly the desire to go to college. Other negative perceptions included separation from sweethearts, family, and friends; safety and security fears; lack of control over one's life; and inadequate salaries. In talks with hundreds of recruiters across the country in the last two years, our staff found that recruiters agree that these are the concerns of young people regarding the military, but the recruiters believed they could overcome the objections when they have an opportunity to discuss them with potential enlistees.

## **Market Segments**

The Services value the ability to identify the "high quality" market, that is, youth who were high school seniors or graduates, and who would score at or above the 50th percentile on the AFQT. The RAND Corporation model (Orvis, 1984; Orvis & Gahart, 1989) estimates the probability of survey respondent groups scoring in this AFQT range. It places 70 to 75 percent of survey respondents in the desired test score range. The information gained provides the recruiting commands with important information as to attributes and incentives that appeal to high-quality youth.

With data on the estimated AFQT scores of the general population, researchers examined differences in values, awareness, habits, and actions between groups with differing AFQT estimates. Youth with higher test scores had different listening and viewing habits and greater awareness of advertising messages. Youth categorized as work-oriented had higher inclination to enlist, but were more often from lower test score ranges. The findings had significant implications for recruiting and advertising managers on programs offered, marketing and advertising strategies, advertising messages, and the media mix used to communicate the messages.

## **Awareness and Media Habits**

A key use of surveys has been to measure awareness of advertising, including the ability to recall advertising messages and slogans and to identify the media mix most listened to or viewed. Advertising influences attitudes and creates a call to action.

The degree to which awareness influences youth to action is discussed in the fourth chapter, Influencing the Market.

Findings from the surveys were fairly consistent (Elig, 1988). Youth spend more hours listening to the radio (approximately 20 hours per week) than they do viewing television (approximately 10 hours) or reading magazines (approximately 3 hours). However, when they were asked to recall Service advertising, they had a higher recall percentage for TV and magazines than for radio. Direct mail was most often cited as the recall source by the age and education groups of most interest to the Services. The surveys also showed differences by age, AFQT scores (both estimated scores derived in YATS and ACOMS, and actual scores derived from New Recruit Surveys), and ethnicity. Younger groups and those with higher test scores spent the most time listening to radio, while lower AFQT groups were the heaviest TV watchers. Higher AFQT groups had the greatest degree of recall.

The relationship between awareness and perceptions was significant. Those who recalled specific Service advertising were more familiar with Service offerings; those who were familiar with Service offerings generally had a more positive perception of that Service. The lesson learned is best exemplified by the Army experience.

The recruiting success of the Army was not due solely to the size of its advertising budget. As one sage official stated, spending more money on a bad product will only result in more bad advertising. The Army was successful in turning around its image by clearly identifying the desires of the target market, by developing incentives to satisfy those desires, and by designing effective strategies and executions to communicate the offerings.

Its efforts affected propensity because its products were in line with youth desires. High awareness levels measured in various surveys verified the effectiveness of the Army approach.

The Navy slipped significantly in terms of awareness and desirability during the 1980s. Its own strategic study confirmed the relatively poor perception of the Navy. Over the last two years, the Navy has made changes in its product offering, its strategy, and its message. The latest YATS report (1989) indicated that this effort is yielding positive results. Propensity levels have started to increase, and the quality of Navy recruits relative to the other Services has also been on the upswing.

The Marine Corps was close to the Army in developing an image that appealed to a particular segment of youth. It was very successful in attracting what the Corps considers its prime market: tough, smart youth whose primary interests do not include college. The Air Force, despite its limited resources, relied on its New Recruit Survey and advertising agency focus group work to meet youth goals and to transmit its message as *the* high-tech Service.

#### **SUMMARY OF TECHNICAL REVIEW OF INDIVIDUAL SURVEYS**

Given the magnitude of reviewed survey research, this report does not provide a comprehensive survey-by-survey review; rather it provides an overview that represents a broad sketch of the corpus of survey research. Readers interested in specific surveys should review the abstracts in the Compendium of Market Research Studies.



## **National Longitudinal Surveys of Labor Market Experience**

The National Longitudinal Surveys of Labor Market Experience (NLS) were initiated in 1966 by the U.S. Department of Labor (DoL). The goal of the NLS was to measure and track labor market experiences on representative male and female samples of the U.S. population. By 1968, four cohorts of respondents (different age range and gender combinations) were tracked on a biennial, and in some cases annual, basis.

In 1979, a collaborative effort between the DoL and DoD resulted in the addition of a new youth cohort to the NLS research program, the National Longitudinal Survey of Youth Labor Force Behavior (NLS-Y). The NLS-Y cohort comprised (1) a cross-sectional, nationally representative sample (6,111); (2) a supplemental sample that overrepresented blacks, Hispanics, and low-income whites (5,295); and (3) an enlisted military sample (1,280). Youth in the cohort ranged in age from 14 to 21 in 1979. The data collected from the NLS-Y were weighted estimate population values. As of the early 1980s, surveys of the two male cohorts were discontinued: As of 1990, surveys of the two female cohorts continued.

Questions related to military service were included. The ASVAB was administered to the entire NLS-Y sample in 1980, providing a new normative base for the enlistment test (documented in the Profile of American Youth study, Center for Human Resource Research, Ohio State University, 1988). Many variables in the NLS-Y provide a longitudinal data base of interest to military research on relatively large numbers of youth who chose alternative career paths (i.e., school, civilian work, military service). Variables included:

- Marital history
- Schooling
- Current labor force status
- Jobs/employee information
- Training
- Geographic residence
- Work experience
- Military service
- Health
- Fertility
- Income and assets
- ASVAB scores

The retention rate for NLS cohort members has averaged approximately 96 percent.

The NLS data collection methodology was relatively sophisticated. Surveys were administered to cohort members primarily through face-to-face interviews. Interviewers were extensively trained and monitored, and data verification steps were followed throughout the data collection and data base construction. Public use data files are available from the DoL, and files containing 1980 NLS-Y and ASVAB data were provided to OSD and each of the Services.

The documentation of the NLS data base is quite thorough, including references to military studies as well as hundreds of other projects that have used the data base. It is updated regularly. Considerable military research has used the NLS-Y data base, but the currency of the data is questionable since the military emphasis to the sample was reduced in 1984 and the ages of the cohorts are now relatively old (27 to 34 years).

#### **Youth Attitude Tracking Study (YATS)**

The YATS survey research program is rich in history. YATS is an ongoing OSD-sponsored survey whose 16-year data base is readily accessible to all Service components

and other research entities. YATS collects data from nationally representative samples of youth. Spring and Fall administrations were conducted from 1976 to 1980. From 1981 to 1990, the surveys consisted only of Fall administrations. The sample was broadened from 16-21-year-old males in 1975 to 16-24-year-old males and females in 1989. The survey uses computer-assisted-telephone-interviewing (CATI) techniques. Survey data are weighted to reflect population proportions. A description of each wave of YATS from 1976 to 1988 (Derived from Laurence & Bridges, 1985) is presented in Appendix B.

General content areas of YATS include:

- Measures of propensity to join the active and Reserve military.
- Future intentions and alternatives to military service.
- Major influences and attitudes affecting enlistment decisions.
- Attitudes toward incentives, advertising exposure, and Service images.
- Types of information-seeking activities and contact with military recruiters.
- Demographic characteristics.

While the content of the YATS has changed somewhat over the years, the basic objectives have remained the same. Since it is not affiliated with any specific Service, YATS is an "objective" measure of the enlistment propensity of youth, and other variables such as attitudes, motivations, characteristics, and advertising effectiveness. In addition to use by recruiting and advertising managers, YATS data have also been used by Service and OSD manpower planners and programmers to justify resources and to support the implementation of recruiting programs.

Since YATS data are collected annually, longitudinal trends are analyzed. YATS documentation is thorough, allowing relatively easy use of the data sets. YATS data have been merged with military applicant and accession files to estimate the probability that those taking the ASVAB will actually enlist in the military (Orvis, 1982, 1984, 1986). It was found that youth who made an unaided mention of joining the military were most likely to enlist (49 percent); youth without an unaided mention, but with positive propensity were less likely to enlist (15 percent). Although those with a negative propensity were least likely to enlist (5 percent), in terms of absolute numbers the number in the negative propensity group is much greater. Thus, many enlistees do come from the negative group. It would seem prudent to conduct research to better understand the negative propensity group, and what causes members of that group to decide subsequently to enlist.

The probability of a YATS respondent falling in the upper half of the AFQT distribution was estimated (Orvis et al., 1989) using demographic information such as grades in school and parents' level of education. The model provides recruiting managers with an additional tool to target the high-quality youth market. Attempts also have been made to use YATS data to profile market potential at the local level. The sample sizes, while efficient for analyses of the general population, are too small for reliable local area analyses of propensity and attitude data.

## **ARMY COMMUNICATIONS OBJECTIVES MEASUREMENT SYSTEM (ACOMS)**

ACOMS was broader than YATS and was designed by the Army to gather information from a representative sample of American youth, and it also solicited information from parents. The survey questions tap primarily Army interests.

ACOMS supported Army assessment of advertising program effectiveness, advertising strategy, and advertising management and planning for future strategy. The survey included questions on educational/career intentions and propensity, importance and knowledge of Army attributes, attitudes toward advertising, media habits, slogan recognition, parental location, social influences, and tracking information. Analyses focused on Army image compared to other Services, the dual-market recruiting strategy, media habits, recall of advertising, knowledge of Army offers, and parental versus youth perceptions of importance of attributes and the perception that they were offered by the Army.

ACOMS was planned as a multiyear longitudinal study with sophisticated sampling, administration, and tracking techniques. The sample was representative of 16-to-24-year-old youth, as well as of their parents. Administration used CATI techniques. The response rate for the data collection from October 1986 through June 1987 was 63 percent. Household screenings were completed in 83 percent of the sample, and actual interviews were conducted in 76 percent of the screened households.

The ACOMS data showed that the Army's image was broad and undifferentiated compared to the other Services. Factor analyses indicated that most attributes mentioned (e.g., develop potential, opportunity to become more mature, work with high-tech equip-

ment) loaded fairly highly (between .546 and .809) on a single factor describing the Army image. The other Services were characterized by two distinct factors -- an internal one related to opportunities for self-development, and an external one related to environmental opportunities such as value to a civilian career.

Research on the dual-market concept has shown that work-oriented high school students are a more favorable market for Army recruiters than college-oriented students. Work-oriented students display higher unaided (5.2%) and aided (29.2%) intentions (College students 1.6% and 20.4%, respectively), and they also are more likely to agree with the important Army attributes (77.2% compared to 72.9%). Analyses compared youths' perceptions of the Army with their parents' perceptions. About the same percentage of young men and their parents believed that an attribute was important, but parents were less likely to agree that the Army offers the attributes. Differences between the importance of an attribute and whether it is attainable in the Army were greater for parents.

The ACOMS provided valuable lessons on survey research in the military. While the data had the potential to be very useful to Army advertisers, a number of factors combined to bring the research to a halt after the first year. The cost and size of the program were significant factors, and when research budgets were cut the ACOMS was a vulnerable target. The complexity of the study design and difficulty in working with the data also worked to its disadvantage. The difficulties with using the ACOMS data base also discouraged wide usage outside the Army. Separate ACOMS reports describe the survey design, survey analyses, survey methods, users' manuals, and supplementary tabula-

tions. On hindsight, ACOMS was too ambitious. It encompassed all areas of market research rather than focusing on specific objectives. This created technical difficulties. Specialized training was required to access and use the data base. ACOMS was also expensive to maintain. The documentation would be exceptionally helpful in designing future studies.

During the project workshop, attendees suggested that future work similar to ACOMS also should identify possible obstacles to enlistment. The consensus was that the Services need to understand the objections youth have against enlisting. This information would be particularly useful in overcoming erroneous perceptions and minimizing legitimate concerns.

### NEW RECRUIT SURVEY (NRS)

The Services have tried to learn more about what motivates youth to enlist by surveying new recruits. Each has an NRS, administered to recruits at basic training, focusing on enlistment motivations. The NRS has been driven largely by operational rather than theoretical concerns. Thus, data analysis was generally directed toward specific issues and, with the exception of the Army, not published. A content comparison of the four Service NRSs as of 1987 is presented in Table 2.2.

Table 2.2

"New Recruit" Survey Questions Common to Four, Three, and Two Service Surveys

<u>QUESTION AREA</u>	<u>Air Force</u>	<u>Navy</u>	<u>Marine Corps</u>	<u>Army</u>
<b>ALL FOUR SERVICES</b>				
ADS - RATE SERVICE MAIL-OUT	YES	YES	YES	YES
ADS - RATE SERVICE SPECIFIC ADS	YES	YES	YES	YES
ADS - RATE SERVICE SPECIFIC MAG. ADS	YES	YES	YES	YES
ADS - RATE SERVICE SPECIFIC PAPER AD	YES	YES	YES	YES
ADS - RATE SERVICE SPECIFIC RADIO AD	YES	YES	YES	YES
ADS - RATE SERVICE SPECIFIC TV ADS	YES	YES	YES	YES
BENEFIT - JOB/SKILL TRAINING	YES	YES	YES	YES
DEMOGRAPHIC - MARITAL STATUS	YES	YES	YES	YES
DEMOGRAPHIC - RACE	YES	YES	YES	YES
EDUCATION - HIGHEST LEVEL OF EDUCATION	YES	YES	YES	YES
INFLUENCER - DISCUSS ENLIST WITH COUNSELOR	YES	YES	YES	YES
INFLUENCER - DISCUSS ENLIST WITH FATHER	YES	YES	YES	YES
INFLUENCER - DISCUSS WITH MOTHER	YES	YES	YES	YES
INFLUENCER - DISCUSS WITH SPOUSE	YES	YES	YES	YES
INFLUENCER - DISCUSS ENLIST WITH TEACHER	YES	YES	YES	YES
INFLUENCER - FATHER EVER IN SERVICE	YES	YES	YES	YES
INFLUENCER - FRIEND IN-SERVICE RECOMMEND	YES	YES	YES	YES
INFLUENCER - INDIVIDUAL(S) INFLUENCE ENLIST	YES	YES	YES	YES
INFLUENCER - REASON(S) FOR ENLISTMENT	YES	YES	YES	YES
OPTION - OTHER SERVICE WOULD JOIN	YES	YES	YES	YES
RECRUITER - FIRST CONTACT WITH RECRUITER	YES	YES	YES	YES
<b>THREE SERVICES</b>				
ADS - RATE SERVICE SPECIFIC BILLBOARD	YES	--	YES	YES
ADS - TIME READING AGRICULTURAL MAGS	YES	--	YES	YES
ADS - TIME READING AUTOMOTIVE MAGS	YES	--	YES	YES
ADS - TIME READING ENTERTAINMENT MAGS	YES	--	YES	YES
ADS - TIME READING ETHNIC MAGS	YES	--	YES	YES
ADS - TIME READING NEWS MAGS	YES	--	YES	YES
ADS - TIME READING SPORTS MAGS	YES	--	YES	YES
ADS - TIME READING TRADE/TECH MAGS	YES	--	YES	YES
ADS - TIME READING YOUTH MAGS	YES	--	YES	YES
ADS - TYPE OF RADIO LISTENING	YES	--	YES	YES
ADS - TYPE OF TV MOST PREFER	YES	--	YES	YES
ADS - WHEN WATCH CABLE TV	YES	--	YES	YES
DEMOGRAPHIC - AGE	YES	YES	YES	--
DEMOGRAPHIC - ENLISTMENT AREA	YES	YES	--	YES
DEMOGRAPHIC - POPULATION OF HOME WHEN ENLIST	YES	--	YES	YES
DEMOGRAPHIC - PRIMARY STATUS WHEN ENLIST	YES	--	YES	YES

(Continued)



Table 2.2 (Continued)

"New Recruit" Survey Questions Common to Four, Three, and Two Service Surveys

<u>QUESTION AREA</u>	<u>Air Force</u>	<u>Navy</u>	<u>Marine Corps</u>	<u>Army</u>
<u>Three Services, Cont.</u>				
DEMOGRAPHIC - SEX	YES	--	YES	YES
EDUCATION - EDUCATION PROGRAMS	YES	--	YES	YES
EDUCATION - TYPE OF SCHOOL LAST ATTENDED	YES	--	--	YES
INFLUENCER - MOST IMPORTANT REASON				
ENLIST	YES	--	YES	YES
OPTION - ENLIST UNDER DEP	YES	YES	--	YES
OPTION - RATE LIFE GOALS	YES	YES	YES	--
RECRUITER - CONTACT WITH OTHER				
RECRUITERS	YES	--	YES	YES
SERVICE - RATE STATEMENTS ABOUT SERVICE	--	YES	YES	YES
SERVICE - WHEN DECIDE JOIN SPEC. BRANCH	YES	YES	--	YES
<u>TWO SERVICES</u>				
ADS - BELIEVABILITY OF SERVICE ADS	YES	--	YES	--
ADS - RATE DISPLAY	YES	YES	--	--
ADS - RATE DOD ADS	YES	YES	--	--
ADS - RATE SERVICE SPECIFIC MOVIES	YES	YES	--	--
ADS - TIME READING FAMILY MAGAZINES	YES	--	--	YES
ADS - WHEN LISTEN RADIO	YES	--	--	YES
ADS - WHEN WATCH TV	YES	--	--	YES
BENEFIT - DENTAL CARE	YES	YES	--	--
BENEFIT - ENROLLED IN G.I. BILL	YES	--	--	YES
BENEFIT - MEDICAL CARE	YES	YES	--	--
BENEFIT - PAY/ALLOWANCES	YES	YES	--	--
BENEFIT - RECREATION FACILITIES/PROGRAMS	YES	YES	--	--
BENEFIT - RETIREMENT SYSTEM	YES	YES	--	--
BENEFIT - TRAVEL OPPORTUNITIES	YES	YES	--	--
BENEFIT - WOULD YOU ENROLL IN G.I. BILL	YES	--	--	YES
EDUCATION - NON H.S. GRAD - GED Y or N	--	YES	--	YES
EDUCATION - TAKE ASVAB AT H.S.	YES	YES	--	--
EDUCATION - TYPE OF HIGH SCHOOL				
PROGRAM	YES	--	--	YES
EDUCATION - FUTURE EDUCATIONAL GOALS	YES	--	--	YES
EDUCATION - TYPE OF SCHOOL LAST ATTENDED	YES	--	--	YES
INFLUENCER - DISCUSS ENLIST WITH SIBLINGS	YES	--	YES	--
INFLUENCER - MOTHER EVER SERVE	YES	YES	--	--
OPTION - ACTION IF COULDN'T ENLIST	YES	--	--	YES
RECRUITER - RECRUITERS' KNOWLEDGE	YES	--	YES	--
SERVICE - ACCURACY OF INFO ON JOB	YES	--	--	YES
SERVICE - CLASSIFICATION OF CAREER FIELD	YES	--	YES	--
SERVICE - IMAGE/PRESTIGE OF SERVICE	--	YES	YES	--
SERVICE - PLANS TO MAKE SERVICE CAREER	YES	--	YES	--
SERVICE - WHEN DECIDE TO JOIN MILITARY	YES	YES	--	--
SERVICE - YOU RECOMMEND OTHER ENLIST	YES	--	--	YES

a As of 1987.

The Army has the best documented NRS data base, so this review focused upon those surveys. This research program collects data at eight Army Reception Battalions. It began in response to questions posed by the Army Deputy Chief of Staff for Personnel (DCSPER) regarding the demographics and enlistment motivations of Army recruits. The DCSPER's questions included the following:

- Who is enlisting in the Army and why?
- Who are the AFQT Categories I-IIAs (individuals scoring at or above the 50th percentile on the AFQT) and where do they come from?
- Why have recent recruits joined, and what is their propensity to remain in the Service?
- What recruiting practices/advertising are the most successful and why?

In 1982, the NRS was first administered to Army recruits.<sup>2</sup> Through 1989, the Army NRS had four forms. Three forms had overlapping content and were completed by Regular Army recruits; the fourth form was completed by Army Reserve and National Guard recruits. Although survey content varied from year to year, it generally covered at least three areas: (1) demographics, initial contacts with the Army, and reasons for enlistment; (2) advertising; and (3) education and employment history. The survey grew steadily longer throughout the years until 1990, when it was shortened considerably. NRS was fairly well-documented from 1982 to 1987. Since 1987, the documentation has not been published for public release. The documentation each year consists of a user's

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<sup>2</sup> The first Army new recruit survey was called the 1982 DA Survey of Personnel Entering the Army. In 1983, the name was changed. It and all subsequent recruit surveys were entitled the Survey of Army Recruits.

technical manual, a set of codebooks, and a set of volumes which display cross-tabulated results.

The NRS was initially administered only during the summer. To test for seasonal effects, it was also administered in winter 1983 (although this data collection was not publicly documented), and winters 1984 and 1985. In 1987, 1988, and 1989, the Army used a year-round sampling. In 1990, the Army returned to summer-only data collections. The decision was based on resource considerations and on analyses which indicated that seasonal variation would not compromise the validity of data collected.

Data from the Army NRS clearly indicated the importance of specific factors in a recruit's decision to enlist. Important factors were self-improvement (including learning skills to prepare for post-Army life in the civilian sector), money for education, and job skills. The analyses showed different effects between demographic groups. For example, higher aptitude youth were influenced more by money for education and shorter terms of enlistment, while new recruits with lower test scores had been attracted by job skills, longer enlistments, and benefits.

Review of the NRS over a 4-year period by the Army Research Institute for the Behavioral and Social Sciences showed different listening patterns for youth with higher and lower aptitude. Higher scoring youth showed significant exposure and reaction to TV, although they watched less television than other recruits. Recruits reported over 20 hours per week of radio listening time (primarily FM stations), with higher test scorers the heavier listeners during the day and early evening. Lower scoring youth listened to more

radio during the late night and very early morning hours. Magazine reading was relatively low.

In sum, the Army NRS is a robust tool that has been valuable to the Army research community, manpower planners, and recruiting managers. A key point that differentiated the Army NRS from the surveys of the other Services was that the Army NRS captures the social security number of respondents. The SSN permits researchers to merge data from distinct market segments, and to obtain realistic market information. Until 1989, the other Services did not record the SSN (in some instances, they did not obtain any demographic information). Thus, the usefulness of NRS results from the other Services is questionable.

#### **Miscellaneous Propensity/Incentive Surveys**

A number of surveys were included in the area of understanding the market that were not part of a large, documented survey research program. Most were either one-time surveys that measured specific concerns of researchers (e.g., surveys of enlistment incentives) or contained proprietary data (e.g., the Navy Strategic Study conducted by BBDO-New York, the Navy's advertising agency). These studies were divided into two types: (1) surveys of enlistment incentives, and (2) general propensity surveys.

Surveys of Enlistment Incentives. The surveys of enlistment incentives assessed the attitudes of the prime youth market toward different options (Fisher & Rigg, 1974; Kaplan & Harris, 1983, 1986). Options included both monetary incentives (e.g., money for college and enlistment bonuses), and non-monetary incentives (e.g., station of choice). These

instruments examined the underlying motivators of Service enlistment (ranging from skill training to getting away from home) that would attract segments of the youth market.

Certain military benefits (e.g., retirement, medical services, guaranteed salary) also were assessed for their usefulness as incentives. Differences in attractiveness of incentives by quality level and propensity were discussed. Kaplan reported that the highest rated reasons were those available to everyone: guaranteed monthly salary, free medical and dental care, and retirement benefits. Also highly rated were on-the-job training, money for college, and service to country. Youth who had higher AFQT scores preferred educational benefits and lower scoring youth preferred skill-related incentives. Other well-rated incentives were guaranteed choice of duty station and low interest loans for buying a home. Kaplan's findings, derived from high school students who volunteered to take the survey, differed from many other surveys in finding that economic reasons were the primary reasons youth enlisted.

General Propensity Surveys. Except for ACOMS, most Service general population surveys have not been published. During site visits to Service recruiting headquarters, the project staff received briefings on the design and findings of the studies for use in this project. Surveys completed by the Service advertising agencies contain proprietary data. However, it would be in the best interests of all Services if youth market information from agency surveys were shared, particularly since many contain across-Service perceptions of youth.

### **Recruiting Specific Subgroups**

Market research studies focusing on subgroups have been analyzed separately. The studies normally involved separate data collections, sampling specific subgroups of interest, or analyses combining surveys and data files. Three subgroups of interest to the military (aside from their primary interest of young males) are women, older males, and minorities.

Studies on women (Grey Marketing, 1980; Kiplinger et al., 1985) and older males (Borack, 1982; Finnessy, 1984) used YATS data or surveys similar to YATS. Propensity to join the military, attractiveness of incentives, Service preference, and the relationship between propensity and enlistment were analyzed. The few studies of minorities consisted only of quality-level research of black high school students (Market Facts, 1982) and examining qualification requirements for Hispanics (Wood, 1986).

Research on propensity and attitudes on incentives for subgroups (women, older males, and minorities) did not provide a significant amount of data, and the data were outdated. Given the growing percentage of these groups in the entry-level job market, the issue is whether data should be routinely collected for subgroups via specific surveys.

### **Surveys of Reserve Components**

While general surveys contain sections regarding the Reserve Components, these surveys were really aimed at active component recruiting. Relatively few studies were aimed exclusively at the Reserve Component market. Two were reviewed (Associates for Research in Behavior, 1980; Klopp, 1982). The former surveyed enlisted personnel on their intentions to join the Reserves, and the latter was addressed to current Reserves.

Data analyses included propensity to join the Reserves; subgroup differences; awareness of Guard/Reserve opportunities; impact of civilian company policy on intentions; and effect of enlistment incentives on propensity.

Propensity to join the Reserves varied from 9 to 25 percent, with the highest propensity for non-prior service males. Former active duty service females not in the Reserves had the lowest propensity. Positive propensity individuals were significantly more likely to be single, to be members of a minority group, and to have at least one friend thinking about joining the military. Other positive influences on joining the Reserves were working for a company with a favorable policy toward Reserve participation, and believing that participation would help in their civilian jobs. One-time enlistment bonuses were more attractive than educational assistance, except for those planning on continuing their education. The data indicated differences in reasons for enlisting. For those already in the Reserve Components, the most important reasons stated for joining were extra money (48 percent), retirement benefits (42 percent), and service to country (35 percent).

Research on the Reserve market needs to be updated and focused to address Reserve recruiting constraints. For example, Reserve recruiting relies on the ability to enlist for vacancies in the local geographic area. There is also a need for quick-turnaround, qualitative type studies on incidents such as Operation Desert Storm for the Reserves. Reserve recruiting studies are not often published or disseminated to the recruiting community. There may be findings within Reserve studies that have particular relevance to the regular components.

## **Individual Enlistment Decision Making**

The surveys that comprise the heart of "Understanding the Market" are based primarily on immediate, applied informational needs. There also were some studies examining the individual enlistment decision-making process. Described here are a study by Hosek and Peterson in the early 1980s, and an Army research program on "Modeling the Enlistment Decision" sponsored by Army Research Institute for the Behavioral and Social Sciences (ARI) later in the 1980s.

Hosek and Peterson (1983) developed a "choice-based" sample data base by combining military respondents to the 1979 DoD Armed Forces Entrance and Examining Station (AFEES) Survey and civilian respondents from the 1979 National Longitudinal Survey of Youth Labor Force Behavior (NLS-Y). Although their efforts highlighted the need for individual-level research, little research that has taken advantage of their data base has been published. Their own analyses focused on educational variables. They suggested that high school seniors who planned more education were less likely to enlist, whereas non-student high school graduates who expected more education were more likely to enlist.

The "Modeling the Enlistment Decision" research program included selection of theoretical models most suitable for enlistment decision making and the development of tools to measure variables in the models. The primary model selected was based on Fishbein-Ajzen expectancy theory. The Career Decision Survey was developed to measure Fishbein-Ajzen variables (e.g., behaviors, attitudes, beliefs, social influences), as well as information that could be analyzed using Hammond's Social Judgment Theory model.



The Career Decision Survey was administered to 1,046 Army prospects. (About 80 percent of the sample was drawn from lead refinement lists that included individuals who had responded to Army advertising or were recruiting station walk-ins; the rest was the 17-20-year-old subset of a national probability sample.) Two-thirds of the respondents had discussed this career option with someone, and one-third had seriously considered Army enlistment. The decision model accounted for between 46 and 61 percent of the variance in respondent career intentions. Individuals who were high school graduates were more influenced by work-related variables, such as employment status, wage rates, and labor force experience. On the other hand, high school seniors were more influenced by education-related variables, such as learning proficiency and ability to finance further education. Development and administration of the Career Decision Survey were well-documented. Much of the data, however, have not been analyzed.

Approaches such as those used by Hosek and Peterson (with their "choice-based" sample) and the Army (with its "Modeling the Enlistment Decision" project) have merit for providing tools and information of value to military marketing research.

#### **Army Experience Survey (AES)**

The Army assessed the characteristics and motivations behind enlistment and separation, and the attitudes and experiences of former soldiers with the Army Experience Survey (AES). Respondents provided enlistment-related information that was clearly retrospective in nature. The AES was undertaken in response to questions posed by the Secretary of the Army in the 1984-1985 timeframe. These questions were:

- Where do Army veterans go and what do they do?
- Was the Army helpful to them?
- Are they favorably disposed to joining the Reserves?
- Do they view their service in a citizenship role?

The AES included questions related to demographics and attitudes, perceptions, and experiences associated with both military and civilian life. The instrument incorporated many items from other surveys (e.g., YATS). AES data were collected April-July 1985 from five samples of veterans who left service during FY82 through FY84. The samples included first-term separatees (5,131); first-term attritees (1,616); veterans who had served more than one term, but had not retired (1,098); retirees (500); and ARI Exit Survey respondents (267). The project's primary focus was on first-term separatees. It was administered via multi-wave mailings with telephone follow-up.

The AES data base is fairly rich, carefully constructed, and still reasonably current. Relatively little analysis of the data has been published. Primary documentation consists of a data sourcebook and user's manual, a report of the study methodology, and several volumes of tabular data.

As part of the AES, researchers evaluated the effectiveness of methods for tracking down veterans. Results may be useful for similar data collections in the future. Surveys of veterans could be improved by tracking veterans who were initially given surveys as new recruits and comparing their "before and after" responses. Identifying changes that take place during military service would aid understanding of the entire enlistment/reenlistment decision process.

## CONCLUSIONS ON UNDERSTANDING THE MARKET

Service recruiting managers expressed a number of concerns. The first dealt with the length of time required to analyze survey data and document survey findings. The Services conducted a number of in-house awareness and attitude tracking studies to try to obtain more rapid information. Another frequent comment heard dealt with the redundancy in survey work. Many of the surveys addressed the same issues, and the data pointed to the same findings.

Discussions with recruiting managers also suggested the need for periodic market pulsing. Periodic pulsing is a technique in which a panel of respondents is interviewed repeatedly over time. The technique permits measurement of changes in attitudes, perceptions, beliefs, and values of segments of the youth market in response to Service or external events. For example, periodic pulsing would provide cross-sectional surveys to indicate the impact of modified policies. The dual objectives of such cross-sectional surveys are to:

- Measure the attitudes, perceptions, beliefs, and values of a subpopulation,
- Rapidly identify changes in direction and magnitude in attitudes, perception, etc. Attitude trends are frequently a more important consideration than intensity measured at a single point in time.

A third observation was that survey research has yielded quality data that have not been fully used. In part, this was due to researchers being unaware of survey results that were never published in the public domain. Shifting priorities and a shortage of research staff within certain recruiting commands were also identified as contributing factors. There

appears to be a strong need for a central agent to collect and disseminate market research survey data. This may provide for more efficient use of research findings, and facilitate the sharing of work within and across Services.

The Services agree that survey data provide a wealth of information regarding the lifestyles, values, attitudes, and aspirations of youth and of youth perceptions regarding advertising. The data also point to avenues for exploration regarding what will swing a youth's decision toward a military enlistment. That information would be even more useful if a system and procedures are developed to obtain and apply data in a more rapid fashion. Recommendations in regard to such a system and procedures are in the management report (Title: Summary of Military Manpower Market Research Studies: A Management Report), September 1991, FR-PRD-91-10).

## Chapter 3

### IDENTIFYING THE MARKET

The decision to transition to the All-Volunteer Force (AVF) carried with it an implicit decision to emphasize an occupational rather than an institutional approach to recruiting. That is, youth would be offered tangible rewards (e.g., pay comparable to civilian earnings, bonuses, occupational choice and training) in contrast to the traditional appeal to intangibles such as service to country. Without conscription, the Services had to compete directly with the private sector and post-secondary schools for bright young recruits. To compete effectively, sufficient levels of recruiting resources and incentive programs had to be justified in the budget process. Once acquired, resources had to be allocated efficiently among recruiting programs and territories. The key to solving these problems was quantifying the impact of economic and other variables on the supply of enlistments.

### STUDIES OF ENLISTMENT SUPPLY

Using the models from the *President's Commission on an All-Volunteer Armed Force* (Volumes I and II, 1971) as a starting point, the Services sponsored research to uncover the relationships among the variables that influenced enlistment decisions by individuals. This body of research was known commonly as studies of enlistment supply.

In general, enlistment supply studies estimated mathematical relationships between the number of enlistments (accessions or contracts) and a variety of explanatory variables.

It was only natural that studies of enlistment supply were constructed within a labor supply framework. On the basis of a time-series/cross-sectional study of enlistment supply across the four Services, 1976-1982, as outlined at the conference of the Southern Economic Association (Goldberg & Greenston, 1983), enlistments were viewed as heavily influenced by economic considerations. It was assumed that individuals compare work in the military with work in the private sector, and select the one that maximizes economic benefits. The basic assumption was that the inclination to enlist would increase if there were an increase either in military pay or in unemployment.

Studies focused on the effects of various controllable and exogenous variables. Examples include relative military compensation (the ratio of civilian wages to military compensation that includes pay, tax advantages, and subsistence), youth unemployment, and recruiting effort. A complete list of explanatory variables is shown in Table 3.1.

#### **Development of Enlistment Supply Models**

Analysts developed enlistment supply models using econometric regression-based techniques. In general, enlistment supply studies had four main purposes: (1) production of long-term forecasts (5-7 years) of enlistment contracts or accessions; (2) computation of economic elasticities of variables affecting the enlistment decision; (3) quantitative insights into resource allocations; and (4) short-term forecasts (up to 12 months) to forewarn of impending supply/demand disequilibrium that would necessitate policy changes.

Table 3.1

Factors Believed to be Related to Enlistment Supply

<u>Sociodemographic</u>	<u>Taste</u>	<u>Policy</u>	<u>Econodemographic</u>
Age	Perceptions	Recruiters	Unemployment
Gender	Propensity	- location	Wage Scales
Race/Ethnicity	Values	- experience	Urban Mix
Education	Habits	- numbers	Qualified Military Available Ratios (QMA)
Occupation	(By Subgroup Characteristics)	Advertising	Median Income
Family Characteristics		- levels	
Marital Status		- media mix	Cohort Size
Aptitude		Relative Military Compensation (RMC)	Cost of Higher Education
		Inter-Service Competition	
		Delayed Entry Program	
		Skill Requirements	
		Terms of Enlistment	
		Standards	
		Goals/Missions	
		Incentives	
		- bonuses	
		- educational	

The techniques employed in the models ranged from simple ordinary least squares (OLS) regression using aggregate, cross-sectional data to more sophisticated, stochastically linked switching regressions designed to account for supply-demand constrained functions, simultaneity bias, and autocorrelation. The selection of variables and estimation technique was influenced by the specific goal at hand.

Table 3.2 provides a summary of the models reviewed. Researchers employed the concept of elasticity when reporting supply effects. The elasticity of supply of a factor is the percentage change in enlistments for a one-percent change in the factor. For example, an elasticity of 0.5 for recruiters means that a one-percent increase in the number of recruiters would result in a half a percent increase in enlistments.

Studies of enlistment supply show wide variations in the type of data, explanatory variables, and the functional form of the estimated relationships. Through 1983, studies yielded more questions than answers. While most authors agreed on the direction of effects, there was wide divergence in magnitude. For example, reported elasticities for recruiters ranged from 0.08 (Amey et al., 1976) to 1.20 (Amey, 1983); wage elasticities from -.80 (Dertouzos, 1984) to 4.16 (Kostiuk & Grogen, 1987); advertising elasticities from -.04 (Amey et al., 1976) to 3.01 (Bres, et al. 1981); and unemployment elasticities from -.09 (Goldberg, 1982) to 2.3 (Daula & Smith, 1984). The variations primarily reflect omitted or incompletely measured variables. Some were due to the time periods studied; for example, Amey's -.04 advertising elasticity was conducted at the time of the Vietnam War, when draft attitudes strongly affected supply.

To understand the differences, one must remember that the early research efforts had no established baseline. Military manpower market research was in its infancy, with all that implies -- the selection of dependent variables eventually found to be incorrect, data that were at an overly aggregated level, and, given the newness of the AVF, an inability to gather data over time. Therefore, the early work on enlistment supply should be viewed not so much in terms of a synthesis where one tries to bring together divergent views, but in terms of what was learned regarding the process of estimating supply.



Table 3.2  
Summary of Active Duty Econometric Supply Models

Study	Service	Dependent Variables	Explanatory Variables Elasticity	Data	Estimation
Amey, Fectler, Huck & Midlam (1976)	Army Navy	(HSDG I-II, HSDG III, total I-III, HSDG I-III, I-III contracts)/17-21 male OMMs	RMCivilian income for 17-21 males, youth unemployment rate, advertising \$, recruiters/OMMs, % black OMMs	CY70-CY74 annually by 9 census regions	Linear, log linear by OLS and TSLS
Aech (1986)	Navy Reserves	Reserve Affiliation	Civilian pay, goals, bonuses, recruits	FY60-FY64 by rating, monthly	Switching regression, logit, bivariate probit
Borack (1986)	DoD	AFOT $\geq$ 50 Military Service Applicants	VAIS survey responses, age, education, race, entry level	FY76-FY82	Logit
Buddin & Wienberger (1985)	Air Force	Enlistment Class	Age, AFOT, race, education, recruitments, employment	AFEE-NLS data base FY78	Multinomial logit
Conteaman (1986)	DoD, All Services	Total HSDG I-III NPS	Civilian pay, recruits, bonuses, unemployment	FY74-FY81 monthly, state level	Generalized least squares quasi- differenced
Crallay (1979)	Marine Corps	Total HSDG, NPS contracts	Recruiters, population, unemployment, civilian, pay	FY78 by recruiting station	Log-linear logistic, linear
Dale & Givoy (1984)	DoD, All Services	(Total HSDG contracts, white & black HSDG contracts)/ 16-19 male population	RMCivilian pay (+4), unemployment rate (-2) (all for 16-19 males), GI bill CPI, VEAP bonus	FY75-FY82 monthly	Linear by OLS and OLS
Davis & Smith (1984)	Army	HSDG I-III contracts	High quality goal, I-III, non HSDG enlistments, other Army enlistments, other DoD high-quality enlistments, military earnings (pay, bonuses, etc./manufacturing production wages, unemployment rate all worked OMM, percent minority in PMA, pro- duction recruits, recruiter experience, local advertising experience, national advertising impressions, percent 1980 Republican vote	Monthly, FY80-FY83 by Army Recruiting District	Log-linear separately for supply/ demand and con- trained, censoring corrections

(continued)

Table 3.2  
(Continued)  
Summary of Active Duty Econometric Supply Models

Study	Service	Dependent Variable	Explanatory Variables/ R-squared	Data	Estimation
Derouzos (1984)	Army	HSDG I-III contracts	HSDG IIB-lower con- tracts, unemployment rate all workers 16 or older, mfg. production wages, 15-19 male population, recruiters high-quality accession quota, low quality accession quota	Monthly, FY80-FY81 by AFES district	Log-linear by two-stage least squares with quotas as instru- ments
Goldberg (1982)	DoD, All Services	Total HSDG, HSDG I-III, HSDG I-II contracts	RMCivilian pay, unemployment rate, (youth job program \$, countercyclical job program \$, blacks)/17- 21 male population, total 17-21 male pop- ulation, Army, Navy, Air Force, Marine recruiters	FY76-FY80 annually by recruiting district	Log-linear by OLS
Goldberg (1981)	Navy	I-III HSDG Total	Civilian pay, advertising \$, G. I. Bill, recruiters	FY76-FY80, annual	OLS regression
Goldberg (1978)	Navy	HSDG I-III Total	Recruiters civilian pay, season, G. I. Bill, unemployment	FY71-FY77 quarterly	OLS regression
Goldberg & Goldberg (1988)	DoD, All Services	NP's I-III HSDG	Civilian pay, recruiters, bonuses, policies region, season	FY81-FY87 monthly, district	Log- linear by OLS level
Goldberg & Greenston (1983)	DoD, All Services	HSDG I-III contracts, HSDG IIB contracts	RMCivilian earnings, change in unemployment rate, avg. unemployment rate, 17-21 male popula- tion, % black male, % urban population of 17-21 males, Army, Navy, Air Force, Marine recruiters	FY76-FY82 annually by recruiting district	Log linear by OLS
Horne (1985)	Army	Male HSDG I-III Accessions	Civilian pay, recruiters, advertising, mission	Second QTR FY77 to second QTR FY84	Generalized least squares, two-stage

(Continued)

Table 3.2  
(Continued)  
Summary of Active Duty Econometric Supply Models

Study	Service	Dependent Variables	Explanatory Variables/ Elasticity	Data	Estimation
Huck & Allen (1977)	DoD, All Services	Total HSDG, HIA, white, HSDG HIA, nonwhite HSDG HIA contracts	Civilian mfg. pay, unemploy- ment rate, recruiters, OMA's by state (17-21 male HSDG HIA, not in college)	CY75	Log-linear Cobb-Douglas by Garza- Marquardt LS
Bram (1984)	Navy	HSDG HIA	Unemployment, civ/mil pay, change in variables	FY78-FY83	OLS/ Box-Jenkins monthly
Kostuk & Grogan (1987)	Navy Reserve	Reserve Affiliations	Recruiters, unemployment population, civ/mil pay, goal, region	FY62-FY86 monthly by state	Log-linear, OLS fixed & random effects
McNaught (1981)	All Reserve Components	Reserve Accessions	Civ/mil pay, unemployment, OMA, season, region	FY73-FY78, quarterly	Logit
Money (1980)	Navy	HSDG, HSDG HIA contracts, leads	RAC/civilian pay, unemploy- ment rate, youth unemploy- ment rate, % urban, DEP YATS propensity, recruiters, minority and overall recruiting \$, HS advertising \$, HS seniors, % black	CY76-CY78 monthly by recruiting district	Linear, log linear by OLS and TSLS
Pope & Weidenan (1975)	DoD, All Services	17-21 Year Old Males	Recruiters, income, education, unemployment, minority density	CY74, by state	Linear, OLS stepwise
Serfass (1986)	Navy	Nuclear Propulsion contracts	Recruiters, goals, civ/mil pay ratio, unemployment, advertising seasonal effects	FY81-FY85, quarterly	Linear OLS, stepwise
Warner & Goldberg (1981)	Navy	Re-enlistment Probability	Earnings/income stream (ACOL) selective re-enlistment bonuses (SRB)	FY74-FY78, annual occupational area	Probit supply estimation

## Research Approaches and Concerns

Described below are three ways in which study authors built upon lessons learned. These involved periodic reviews of existing models to determine differences, strengths, and weaknesses; use of earlier models as a baseline for new direction; and periodic updating of models by the primary author.

Periodic Reviews. These studies represented detailed reviews of selected models. The reviews pointed out differences in approaches, identified the major strengths associated with the studies, and explained their shortfalls or weaknesses. The output product was normally a set of recommendations which would help provide a roadmap for future research, in contrast to the development of a new model. Examples included:

- *Econometric Models of Armed Forces Enlistment Levels* (Amey, Fechter, Huck, Midlam, 1976). This study reviewed 17 time-series, cross-sectional, and pooled time-series/cross-sectional studies and analyses. The studies reviewed covered the periods 1958-1965 and 1970-1973, and represented the major feasibility studies for the AVF.
- *Factors Affecting U.S. Army Recruiting* (Klopp, 1981). This effort compared seven supply models that used economic variables to predict the dependent variable.
- *Department of Defense and Navy Personnel Supply Models* (Cirie, Miller, & Sinaiko, 1981). This was the report of a workshop that compared and evaluated three supply models developed by RAND, the Center for Naval Analyses, and Duke University.
- *A Framework for Integrating Alternative Military Manpower Supply Methods* (Borack, 1984). This study examined both econometric models and demographic analyses conducted for the 1973 to 1984 time period.

Baseline Approach. The second type of study started with a baseline that compared acknowledged and/or identified deficiencies associated with past enlistment supply models.

The new study authors then provided a model believed to improve upon past models.

Examples include:

- *Enlistment Supply, Recruiter Objectives, and the All-Volunteer Army* (Dertouzos, 1984). This study demonstrated that previous models were deficient in focusing exclusively on supply of single categories of enlistments. It then factored in demand variables (recruiter incentives and quotas) to develop more accurate elasticity estimates of high-quality enlistments with respect to supply variables.
- *An Economic Analysis of Army Enlistment Supply* (Horne, 1985). This study examined reported "problems endemic to enlistment forecasting literature." The author then derived an estimation model believed to improve on past time-series enlistment models.

Periodic Update. In these studies, the primary author periodically updated and refined prior work. The updated work normally applied lessons learned, utilized new techniques, and applied more detailed data. Two primary authors of such work are:

- Goldberg. Basic and updates occurred in 1979, 1981, 1982 (multi-volumes that year)...1988, 1990. His work primarily consisted of refining and updating econometric models related to early warning and enlistment supply models.
- Morey. 1980, 1982, and each year to 1988. This work aimed primarily at determining resource/incentive allocations to optimize quality enlistments.

Some research brought into question the feasibility of measuring enlistment supply via econometric models. Dale and Gilroy (1984) argued that time-series models prior to 1984 exhibited evidence of internal instability. The instability resulted in different elasticities for many variables as the sample size or variables were changed, that is, as studies applied different combinations of the variables identified in Table 3.1. Other reasons for the instability involved both data problems and difficulties associated with dealing

with multicollinearity. That is, there was no simple way to distinguish between the effects of two or more variables that increased or decreased at approximately the same time.

Another obstacle was that supply models required forecasts of unemployment and other exogenous variables. Their accuracy was dependent partly upon the accuracy of forecasts of the economy (Dale & Gilroy, 1984; Goldberg, 1985). Unfortunately, there is a degree of inaccuracy in predicting future levels of economic activity. To try to deal with the problem, manpower planners took an arbitrary approach and projected a constant level for economic variables (unemployment and civilian wages) over the near term. However, economic fluctuations played havoc with economic forecasts and market projections during the late 1970s and early 1980s. As a result, the value of various models was again brought into question.

## **PROCEDURAL LESSONS LEARNED IN THE DEVELOPMENT OF SUPPLY MODELS**

The earlier supply models estimated the number of accessions (i.e., actual enlistments) of young males as a function of variables related to the enlistment decision. Over time, "contracts" (an agreement to join the delayed entry program [DEP]) replaced accessions. The objective became "high-quality" contracts (high school graduate males scoring at or above the 50th percentile on the AFQT).

Guided by economic theory, early analysts identified variables they believed should be related with enlisted contracts. Variables used by all researchers were population, number of recruiters, and unemployment. Others included relative military compensation, goals/missions, incentives, advertising expenditures, more disaggregated levels of

demographics (i.e., race and gender, region), adjustments for seasonality, and personnel policies (e.g., changes in enlistment standards, terms of enlistment, and educational incentives). The early efforts did not have standard definitions of data elements. For example, unemployment rates were reported for many subgroups. Youth unemployment was thought to be the most appropriate, but was not available at smaller levels of aggregation. In light of such differences, direct comparison of results from many early efforts is inappropriate.

Three types of econometric analyses were represented: time-series (Dertouzos, 1984); cross-sectional (Buddin & Witsberger, 1985); and pooled time-series/cross-sectional (Asch, 1986; Kostiuik & Grogan, 1987). The scope ranged from aggregate (national) time-series or cross-sectional (Dertouzos, 1984) to disaggregate (regional) pooled time-series/cross-sectional (Goldberg, 1982).

Many of the studies, particularly prior to 1983, used time-series analyses (Huck & Allen, 1977; Morey & McCann, 1979). However, the models were quite different. Grissmer used monthly data over calendar years with seasonal dummy variables being multiplicative rather than additive. Goldberg used quarterly data and seasonal dummy variables for the first three calendar quarters. Morey and McCann used 11 monthly dummies and two annual dummies (Perelman, 1984).

The early time-series (TS) analyses did have problems. First, the high correlation between variables made it difficult to separate effects. Second, given the relatively short length of time represented in the data (on average, 4 years), there was too little variation

to detect trends reliably. Early studies also had problems due to mixing data from conscription and AVF years.

Illustrative examples of cross-sectional analyses were Pope and Weideman (1975), and Huck (1977). All employed cross-sectional data by state. These analyses had difficulty in separating regional differences across a number of exogenous factors (wages, unemployment, and propensity), and the lack of time variation to allow for lag effects (such as advertising effects).

Dale and Gilroy (1984) pointed out that the principal use of individual time-series and cross-sectional models was in determining which variables were important, rather than the precise contribution of each variable. A number of studies used a pooled time-series/cross-sectional (TSCS) approach (Morey, 1982b; Dale & Gilroy, 1984; Goldberg & Goldberg, 1988). Simultaneous regression analyses enabled researchers to account for variations in enlistment patterns across time and geographic area. Some criticized the pooled approach as including the problems of both time-series and cross-sectional analysis. However, shared information about lessons learned resulted in more recent studies converging on the variables selected and the elasticities of those variables (e.g., pay elasticity in the range of 1.7 to 2.1). The trend has been toward decreased levels of aggregation involving shorter intervals of time, and using application of pooled analyses and other more complex econometric techniques. Findings from the body of enlistment supply research are of two types: those dealing with the process of estimating supply models, and those dealing with the estimates themselves.



Other important procedural lessons learned include:

Incomplete models suffer from estimation bias. It is critical to include all appropriate variables. To be really useful, an enlistment model should include a complete set of critical factors, properly measured; it also must be estimated with recent data using an appropriate estimation technique. The two elasticities that received most attention in enlistment supply models were pay and unemployment -- pay because of its impact on the budget, and unemployment because of its strong and consistent effect on enlistments (Daula & Smith, 1984). However, in examining the sensitivity of the elasticities of these two variables, Daula and Smith demonstrated a drop of 50 percent in the pay/unemployment elasticities when models used a full set of exogenous variables; however, the elasticities doubled again when competition variables were added. Their point was that the parameter estimates in incomplete models suffer from considerable estimation bias.

The inclusion of "demand" variables improves model estimations. The assumption was that the supply of high-quality youth was limited (termed "supply-constrained"). However, over time studies (Goldberg & Greenston, 1983; Daula & Smith, 1984) demonstrated that variables such as changes in enlistment standards and recruiting goals affected the number of high quality youth recruited. A number of models, by either omitting or inadequately representing shifts in policies that constrain the enlistment of available high quality youth (such as standards and goals), yielded erroneous forecasts. However, the effect did not apply to recruiting units unsuccessful in achieving their recruiting goals.

Recruiting management tools affect supply models. Most studies recognized recruiters as an important variable in supply models. However, in the initial 10 years of studies, there was little focus on understanding the role of recruiter incentives and competition systems. Important contributions were made (Dale & Gilroy, 1984; Dertouzos, 1984) with analyses of the impact of recruiting management tools. It appeared that recruiters worked just to achieve goals, despite having the ability to exceed the target. This resulted in high quality being sometimes demand-constrained. Conversely, decisions to require quality above numerical objectives resulted in recruiting more high school graduates who scored above the 50th percentile on the AFQT. Failure to recognize the role of management decisions affected supply estimates.

There is great uncertainty in complex econometric models. Many models had unstable measured elasticities for pay and unemployment, and were dependent upon equally unreliable forecasts of economic activity (Dale, 1984). Dale demonstrated this latter point with the results of two large-scale models (the Institute for Economic Analysis [IEA], 1984, and the Bureau of Labor Statistics [BLS], 1982) which projected total military demand for computer services. The BLS projected a \$4 billion cost by 1995; the IEA estimated over \$20 billion for the same time period. Many researchers have moved away from forecasts provided by other agencies, and developed their own economic forecasts using a combination of leading economic indicators (Goldberg & Greenston, 1988a).

Military market researchers also had to deal with important variables affecting enlistment supply that were not, and will never be, within the control of a single Service or of DoD. Such variables include:

- Those controlled by other agencies -- for example, congressional actions regarding pay and allowances, recruiting programs and resources, and periodic direction regarding enlistment standards; other Services' recruiting programs. A change in any of these variables could have significant effects on forecasts.
- Those that are not controllable, but may be forecasted, such as QMA and high school graduate rates).
- Those that cannot be forecasted with a great degree of certainty, such as youth attitudes and public perceptions.

Learning from its early efforts, over the past 10 years the research community significantly increased the sophistication of its efforts in terms of the numbers and types of independent variables used, the level at which data are collected, and state-of-the-art techniques employed to measure the effects of these variables. There has been a continual strong trend toward increased methodological rigor and more complex specifications. This has resulted in more accurate understanding of business cycles, improved economic projections, and an increased capability to capture the interactions of socioeconomic and sociodemographic variables related to the enlistment decision.

#### WHAT IS KNOWN FROM ENLISTMENT SUPPLY STUDIES

Studies in this chapter were categorized as follows:

- Enlistment Supply
- Market Conditions
- Market Segmentation
- Goal Allocation

As studies were reviewed, it became evident that studies whose primary objectives emphasized market conditions and segmentation were usually subsets of enlistment supply models. Therefore, while this chapter summarizes studies in each of the four areas, the major portion deals with enlistment supply.

### **Enlistment Supply and Market Conditions**

Based on the synthesis, a number of conclusions can be reached regarding the effects of the economy and recruiting resources on enlistment supply. The subject of nearly all of the recent supply models was Army enlistments, so conclusions about Army supply effects are more firmly based. However, we also cite the best estimates available for the other Services.

#### **Supply Effects of Recruiters, Missions/Goals, and Population**

Ideally, analysts would measure recruiting effort with data on labor hours devoted to the recruiting of high-quality youth. Unfortunately, this level of detail is not available. Instead, recruiting effort is measured by the number of production recruiters assigned and two mission/goal categories: high-quality goal (AFQT I-III high school graduates) and "other" goal. Analysts recognize that the effect of recruiters is tied to what managers ask of them. After all, recruiters are not assigned without goals or goals without recruiters. In theory, we would expect that assigned recruiters and high-quality goal/mission would have a positive effect on enlistments. Alternatively, if recruiting resources are diverted to "others," increases in the other goal should have a negative effect on high-quality enlistments.

The coefficient of the recruiter variable measures the "partial effect" of increasing the number of recruiters. The "total effect" is the sum of recruiter and goal elasticities: it measures the combined effects of adding recruiters and giving them goals. We expect the partial effect to be positive (adding recruiters increases enlistments); the total effect should be greater than the partial effect (recruiters with enlistment goals are more productive than those without); and that the total effect of recruiters and goals should have an elasticity less than unity to ensure diminishing returns.

In some formulations (primarily TSCS studies), the dependent variable was not number of enlistment contracts, but contracts per population (i.e., the enlistment probability for a typical individual in the district). Recruiting effort affects enlistment probability by increasing the information available to potential enlistees. Models were specified based on the assumption that information provided per population was a function of recruiting effort per population; therefore, the recruiter and goal variables also were deflated by population. This specification carries with it the implicit assumption that the supply equation is "linear homogeneous" with respect to population, recruiters, and goals: that is, holding all other supply factors fixed, an increase in these variables by Y percent results in Y percent more enlistments. Thus, if two districts were identical except that one had twice as many people, recruiters, and goals, then the larger district would generate twice as many enlistments.

The loglinear functional form has proven to be the most useful for analysis. It permits diminishing marginal returns to increases in supply factors, such as recruiting resources. It also permits the productivity of recruiters to be affected by the levels of

other factors, such as relative military pay. Thus, as relative military pay increases, the productivity of recruiters increases. The regression coefficients are partial elasticities -- that is, the percentage that enlistments change when a supply factor increases by one percent and other factors are held fixed. The coefficient of a dummy variable is the percentage effect on enlistments of the variable increasing from zero to one.

Given the loglinear functional form, the "partial effect" of recruiters is the coefficient (elasticity) of the recruiter variable. The "total effect" is the sum of the coefficients (elasticities) of the recruiter and goal variables. The "homogeneity assumption" implies that the population elasticity is 1 minus the sum of the elasticities of recruiters and goals.

The most rigorous Army supply modeling effort was recently completed (Smith, et al., 1990). Although the primary purpose of the study was to examine the cost effectiveness of the Army College Fund, the modeling effort accounted for all of the pertinent resource and environment variables, and covered a long period (FY 1981-89). Variables were measured at the recruiting district level.

The partial elasticities were as follows: recruiters 0.15, high-quality goal 0.28, other goal -.09 for a combined recruiter/ goal elasticity of 0.34. These estimates are somewhat lower than in previous efforts and may have been diluted by a data anomaly. From FY 1987 to 1989, high-quality contracts declined nearly 18 percent while the number of recruiters increased 8 percent. Past efforts had tended toward a total recruiter elasticity of 0.50. Given that the partial elasticities for the goal variables are plausible, a more realistic partial elasticity for recruiters is 0.31 (the total effect [.50] minus the partial effects of high and other goal [.28 - .09 = .19]). Therefore, the effect of qualified population is

0.50. These elasticities have intuitive appeal. Basically, the evidence indicates that the effect of recruiters and recruiting effort is equal to the effect of population.

Conclusions for the other Services are less precise. Few studies were conducted in the last few years. The most comprehensive study was conducted for OSD to maintain the Enlistment Supply Projection and Enlistment Early Warning System models (Goldberg, 1991). In his latest report, Goldberg discusses the best estimates of supply elasticities. Table 3.3 is extracted from that report with modifications. Overall, the research team concurs with the conclusions reached by Goldberg. The estimated partial recruiter elasticity for the Navy (0.46) and Marine Corps (0.48) were plausible.

Table 3.3

Best Estimates of Supply Factor Elasticities\*

<u>Male, High School Graduate, AFQT Cat I-III A</u>				
	<u>Army</u>	<u>Navy</u>	<u>Air Force</u>	<u>Marine Corps</u>
<b>Factors</b>				
Pay	1.20	0.83	0.70	0.83
Unemployment	0.59	0.46	0.59	0.48
<b>Recruiters</b>				
Partial	0.31	0.46	0.75	0.48
Total	0.50	0.61	0.90	0.60
ACF* Benefits	0.14			
Enlistment Bonus	----			
Advertising	0.05			

\*ACF = Army College Fund.

\* Adapted from "Recent Estimates of Enlistment Supply Models" by Dr. Larry Goldberg, April 1991, page 36, Table 13.

The estimated total effect of goals on Navy enlistments obtained by Goldberg was somewhat high due to an implausible positive elasticity of 0.23 for non-high-quality goal. A positive sign indicates that increasing the goal for lesser quality recruits increases high-quality production. This result was probably attained because the Navy increased goals proportionately - when high-quality goals increased, lesser-quality goals were increased also. Since recruiting lesser-quality takes time away from the primary goal of high-quality, the sign should be negative. Using the Army elasticity for "other" goals as an estimate, we imposed an elasticity of -0.10 for this factor resulting in a more realistic total recruiting effort elasticity of 0.67. This leaves 0.33 for the effect of population. The measured effect of goals for the Marine Corps was between 0.04 and 0.12. The higher value was more consistent with evidence for the other Services.

Direct estimates for the Air Force were implausibly low or high depending on the model. Goldberg obtained an estimate of -0.02 from a TSCS model and 1.02 from a TS model. The total effect of recruiters and goals must be less than or equal to 1.0. Because of small requirements, it is likely that the number entering the Air Force is not strongly influenced by population. A realistic guess as to the effect of population is around 0.10. Therefore, the elasticity for Air Force recruiting effort would be 0.90.

#### Unemployment and Relative Pay

A subset of enlistment supply studies focused upon estimating the impact on enlistments of external factors over which the Services had little or no control. These are categorized in this study under the heading of "market conditions." While many studies were part of an enlistment supply effort, their purpose was to quantify effects and trends



of exogenous business cycle variables such as seasonality, unemployment, and wage differentials on attracting youth to the military (e.g., Dale & Gilroy, 1983).

It was a long-held intuitive belief among recruiting managers and policy staff that two external variables most influenced enlistments: relative wages and unemployment. However, reviews of earlier studies (Dale & Gilroy, 1983; Horne, 1985) did not support hard conclusions. A number of studies found no impact, some found insignificant effects, and others, while statistically significant, were in the opposite direction. The studies reviewed and their reported elasticities are shown in Table 3.4.

In evaluating the effects of unemployment and pay, Kostiuk (1989) reviewed geographic variations in market conditions for the period 1976 to 1987. He examined variations in earnings, college enrollment rates, and unemployment rates over time between different census divisions. He concluded that there were large differences across time and regions and recommended that data be tracked at the local level. Some of his key observations were:

- Average weekly earnings for young male high school graduates fell 19 percent (adjusted for inflation) from 1976 to 1987.
- Declines in earnings of older men (age 26 to 50) declined only 4.8 percent.
- Unlike high school graduates in the work force, wage rates for college graduates increased from 1976 to 1987.
- The magnitude of change varied quite extensively within census division. For example, for weekly earnings, New England was in last place in 1976, second to last in 1982, but in first place by 1987 and it was the only division in which the 1987 earnings were higher than in 1976.
- There were significant differences between regional and national employment rates.

Table 3.4  
Comparison of Army Unemployment and Pay Elasticities

Study	Period	Elasticities	
		Unemployment	Pay
<u>Time Series</u>			
Fisher (1969) <sup>a</sup>	Quarterly:1957-1965	.18	-.46 <sup>b</sup>
Fechter (1970)	Quarterly:1958-1968	c	1.24 to 1.67
Cooper (1977) <sup>a</sup>	Semiannual:FY71-FY76	.11 to .27	.95 to 1.23
Fechter (1978) <sup>d</sup>	Quarterly:1958-1974	-2.08	1.12
Grismer (1978)	Monthly: 6/70-7/75	.37 to .42	1.22 to 1.68
Withers (1978) <sup>b</sup>	Quarterly:1966-1973	-.29	-.28 <sup>b</sup>
Fernandez (1979)	Monthly:7/70-9/78	.05 to .51	.54 to .88
McKnown (1980)	Semiannual:1968-1976	.05	.54 to .82
Dale&Gilroy (1983) <sup>e</sup>	Monthly:10/75-3/82	.94	2.3
Dale&Gilroy (1984)	Monthly:10/73-3/82	.8 to 1.0	.9 to 1.7
Ash (1985)	Semiannual:1968-1976	.13	.88
Horne (1985)	Quarterly:2/77-2/84	.73	2.7
<u>Cross-Section</u>			
Grey (1970)	1964	c	1.5
Huck (1977)	1977	.24	.80
Daula (1982) <sup>a</sup>	1978	2.30	3.36
Baldwin (1982) <sup>a</sup>	1978	.93	3.54
<u>Pooled TS/CS</u>			
Goldberg (1982)	Annually: 1976-1980	.09	2.13
Brown (1983)	Quarterly: 4/75-3/82	f	f

- a. Estimated DoD equations only
- b. Uses ratio of civilian to military pay rather than military to civilian
- c. No effect, and elasticity not reported
- d. Uses employment vice unemployment rate
- e. Nonprior service male diploma graduates, all mental categories
- f. Elasticities not reported; logit equation estimates mixed and low

NOTE: Table derived from Dale & Gilroy (1983) and Horne (1985).

- Indicators of wage growth, such as the Employment Cost Index (ECI), were misleading indicators for the enlistment target market. The ECI contains the wage rates of college graduates, and as ECI moved upward the wages for young male high school graduates were dropping 7 percent.
- There were significant differences in college enrollment rates across census divisions. For example, in the Mid-Atlantic region youth attended college at rates 17 percentage points higher than in the Pacific region and 10 points higher than in the Southwest.
- None of the rates (wages, unemployment, college attendance) were constant over time.
- Unlike the recommendation of Dale and Gilroy (1983) to develop a teenage unemployment variable, Kostiuk believes that, given the .99 correlation he found between youth and general population unemployment rates, the national rates are quite sufficient for the unemployment variable.

The primary conclusions from Kostiuk's and others' studies (Goldberg, 1988; Dertouzos, 1984) indicate the importance of constructing models with monthly and regional data, ensuring that the data are updated at least annually. Another very important conclusion was the need to update the models whenever policy changes are made that impact enlistments (e.g., changes in standards, shifting recruiters, adjusting incentive levels). A critical implication here is the requirement for close coordination between policymakers, managers, and the research community to ensure that researchers are kept up-to-date on key decisions that affect enlistment supply. Some of the key conclusions and implications of Kostiuk's study were:

- Despite the lowest employment rates in 15 years, the suppressed wages in the civilian labor market are a partial reason for the success of recruiting without the need for large increases in military pay.
- Simple counts of high school seniors or graduates are insufficient in setting enlistment goals.

- The economy and labor markets, by region, are extremely dynamic. Shifts occur in fairly rapid fashion. As such, the Services need to have the capability to move resources quickly if they are to maintain a competitive posture. *A significant implication here is that, by its nature, the Planning, Programming, Budgeting System (PPBS) structure serves as an institutional hindrance to responding swiftly to changes in the economy that affect recruiting.*
- Without a full understanding of what has been driving the relative depression in wage scales, it is extremely difficult, if even possible, to predict future earning levels. If a recovery occurs quickly, the Services and Congress would be caught unaware, with subsequent adverse effects upon recruiting.

Most studies discussed the need for more accurate forecasts of employment and civilian wages. One attempt was Goldberg's update to his 1982 enlistment supply projection model, which has been updated annually. Goldberg (1988) used monthly data to relate unemployment to 15 leading economic indicators. He also included forecasts from the Congressional Budget Office, the Bureau of Economic Analysis, Wharton Econometrics, and Blue Chip Economic Indicators. While the data fit the model well, and despite the level of disaggregation and technical complexity, the estimates of his model and the outside sources reportedly did not remain accurate more than 6 months. This again carries the implication of the need for frequent updating of forecast models.

In the most recent studies, the measured effect of unemployment on high-quality enlistments was remarkably similar across the four Services. As shown in Table 3.3, the elasticities ranged from 0.46 for the Navy to 0.59 for the Army and Air Force. Given that similar results were obtained from both TSCS and TS models, these unemployment elasticities are considered quite realistic.

The elasticities of relative pay (based on youth earnings) reported by Goldberg ranged from 0.70 for the Air Force to 1.20 for the Army. Given the less glamorous image

of the Army, it is logical that Army enlistments would be more sensitive to pay than the other Services. The high-tech image of the Air Force probably insulates it from large reactions to changes in compensation.

#### Advertising, Educational, and Monetary Incentives

The studies that concentrated on measuring the supply effect of these variables are discussed in Chapter 4, Influencing the Market.

#### **Market Segmentation**

Market segmentation research developed models to measure market demographics and inclinations to enlist of various subgroups within the total population (Goldberg, 1982; Borack, 1984). Market segmentation studies: (1) define markets of interest; (2) identify trends in those markets; and (3) evaluate their impact(s) on qualification rates of selected demographic groups.

Analytic methods included regression, cluster, discriminant analyses, and simple cross-tabulations. Actuarial, time-series, and other multivariate methods such as regression, logit, and correlation were used to analyze specific market segments. Borack (1986) used logit analysis to profile the "high quality" military market based on information obtained from the Youth Attitude Tracking Study. Barclay (1984) provided summary statistics on 11 years of non-prior service accessions (FY1973-83) stratified by age, quality, utilization, attrition, and marital status to examine the costs and benefits of attracting older accessions. DeTray (1981) used an actuarial approach to evaluate the role veterans could play as a source of military manpower. He used data from the 1979 Current Population Survey

and 1966-1976 National Longitudinal Surveys (NLS) to estimate the number of veterans in the population by various subgroups. DeReu & Robbin (1981) applied factor analysis to the Claritas Corporation geodemographic data set to develop 34 factors. These factors were then used in a regression equation together with a measure of recruiter strength and the proportion of the population enrolled in college to predict the penetration rate (percentage of recruits out of the available population). Finally, Sahai (1984) used a combination of summary statistics, classical regression, and correlation to analyze distributions of AFQT and test scores from the Department of Education's High School and Beyond data base.

In this body of research, population estimates derived from enlisted supply work were subdivided by variables such as race/ethnicity, gender, level of education, socioeconomic status, and age. Other segmentation variables included reading ability, AFQT test scores, and ability to pass a military physical examination. Variables such as wage scales, unemployment rates, and geographic regions were also considered.

Studies generally started with a baseline population, such as 17-21 year old males. The market was narrowed by deducting estimates of those with prior military service, institutionalized, in school having completed more than two years of post-secondary education, and already in the military or having a contractual commitment to join. This population was then segmented by race, gender, region, and other demographic breaks to arrive at an estimate of the qualified military available (QMA) pool.

Authors of more recent studies developed a QMA&I projection, where the "I" represents interest in the military (e.g., Borack, 1984). They believe that the QMA&I projection is a more realistic measure of the market, and the better measure to use when allocating recruiting resources. This factoring process removes individuals who most likely would not enlist in a military service. The market fertility of a given QMA&I is affected by policy and resource variables including recruiters, advertising levels, incentives, policy goals, and quotas (Dertouzos, 1984).

Table 3.5 summarizes the market segmentation studies reviewed. No study gave comprehensive treatment to the processes that led to the final model specification. The results of this type of study, more often than not, were not startling but confirmed previously forecast events such as the diminution of the 17-21-year-old male market. However, better measures of population have contributed to more accurate measurement of enlistment supply.

Although demographic techniques were useful for developing national trends and comparing local areas, they did not directly yield estimates of enlisted supply nor provide insight into the role certain variables play in the enlistment decision. Although segmentation studies provide useful historical snapshots of what the particular market segment looked like at one point in time, given the significant shifts in the sizes of population segments, caution should be used in projecting conclusions across time.

Table 3.5  
Summary of Market Segmentation Studies

Study	Service	Target Market	Statistical Techniques Used/Comments
Barclay/Nasal Post Graduate School (1984)	DoD, All Services	Older age accessions	Comparisons among entry age groups and between males & females in each branch of Service (Education, Mental Group, Occupational Distribution, Altitude & Marital Status).
Borack/Navy Personnel Research & Development Center (1985)	DoD	High-quality	Standard error, chi-square, regression analyses.
DeTray/RAND (1981)	DoD	Prior service accessions	Demographics of prior service pool. This work explains why prior service accessions play a role in the recruitment scheme; it does not offer any suggestions on how to attract this group.
Fernandez/Maral Post Graduate School (1982)	DoD	Prior service accessions percentages, no real statistical analyses used.	Frequencies and percentages.
Fernandez & DeTray/RAND (1984)	DoD, All Services	Prior service accessions	None
Harnovich & Baker (1983)	Navy	Lateral entrants	None Cross reference data base. No data or analyses.
Sahai/Army Deputy Chief of Staff for Personnel (1984)	DoD	HS seniors	Basic means of test scores across education and socioeconomic factor (AFQT test scores).
Shavelson, Hagstrom & Blaschke (1984)	DoD	2-year colleges, & vocational schools	Logit analyses Concluded that recruiting from this segment is uncertain. Recommend additional information.
Shavelson, Hagstrom & Winkler (1983)	DoD	2-year colleges, & vocational schools	None Concluded segment is uncertain. Recommend additional information.
Synectics (1988)	DoD	Health care professionals	None No analysis for evaluation. Basically identifies sources of information available to DoD on health care professionals.
Wood/EDM (1985)	DoD	Hispanics	None "Reference data base" contains annotated bibliographies.



## Goal Allocation

The concept of "market" is key to determining how many recruiters are needed, where they should be allocated, and what their goals should be. The predominant analytic method was econometric forecasting to determine market fertility, followed by a linear programming approach to goal distribution. Often error bands surrounding individual forecasts were not used. Studies in this area were sparse. Much of the work was done in-house by the Services as an operational requirement rather than as research, so results were infrequently published. Notwithstanding, goal allocation is a crucial recruiting management task.

An issue that the few studies in this category recognized was that of equity. Determining recruitment goals has been a major issue for each Service recruiting command. The objectives have been to (1) facilitate communication about expected unit production, (2) provide incentives for field recruiters, and (3) evaluate recruiter performance. Differences in civilian labor market opportunities affected the productivity of recruiters in different areas; production should be expected to vary as a function of recruiting difficulty in the local recruiting market. Studies concluded that any allocation system considered equitable must account for expected differences in recruiting success for a given level of effort. The studies were not specific on precisely how to do this.

Through discussion with various Service representatives, it became apparent that previous production was a main determinant in goals. This had the net effect of rewarding underproduction and penalizing overproduction. RAND has published a review of the Navy goal allocation process. (Asch, 1990) Although the study was not available at the

time of this review, it was one of the few attempts to provide for general review of the goal allocation process.

Through interviews with each of the recruiting commands, it became clear that informed, but subjective, judgments were made by decisionmakers on equitable goals. That is, while recruiting command headquarters used various models to project goal allocations, the second-level command structure (Areas, Wings, etc.) had flexibility in allocating goals to unit levels. Indeed, even at local level, unit commanders had a degree of flexibility in allocating goals to recruiters.

Given the significant operational shifts that frequently occur during the year, the degree of proprietary information involved, and the unique differences and problems faced by the separate recruiting commands, the consensus at the September 1990 workshop was that goal allocation should remain within the operational domain of the recruiting commands.

### CONCLUSIONS ON IDENTIFYING THE MARKET

Developing enlistment supply models has not been an easy task. In large part, this was due to the uncertainty inherent in forecasting trends involving exogenous variables. More to the point, researchers had to discover by trial and error what variables to include and what techniques to use. While earlier studies did provide forecasts, their major contribution was in identifying the key variables and relationships between variables. Later studies applied more sophisticated techniques and used more disaggregated data in constructing more useful models.

Over the past 10 years, the research community significantly increased the sophistication of its efforts in terms of the numbers and types of independent variables used, the use of less aggregated data, and state-of-the-art techniques employed to measure the effects of the variables. There has been a strong trend toward increased methodological rigor and more complex model specifications. This has resulted in more accurate understanding of business cycles, improved economic projections, and an increased capability to capture the interactions of socioeconomic and sociodemographic variables related to the enlistment decision. That is, with the benefit of experience, authors are now proactive in providing more effective shorter term forecasts.

Civilian job opportunities and perceived opportunities for career advancement, relative wage scales, and recruiting effort all have substantial effects on enlistment supply. However, it became apparent to researchers that models and forecasts based primarily on only economic considerations were insufficient. It was clear that non-economic factors also affect enlistment supply. These factors involve attitudes, perceptions, and values of youth and the general public. Efforts to identify and understand these factors were discussed in Chapter 2, Understanding the Market. Although exogenous factors cannot be controlled, some can be influenced by the Services. These factors are discussed in the next chapter, Influencing the Market.

A key finding is the importance of consistency and comparability. Perhaps the major finding with enlistment supply studies deals with their implications rather than their approach. The need for use of less aggregated data, identification of variables that truly have an impact, and the continual search for more sophisticated analytic techniques are

all important findings regarding the process of building enlistment supply models. Recent studies are more consistent in estimating the size of economic elasticities (e.g., unemployment, civilian wages), and in factoring the demand variables into supply models (recruiting resources, recruiters, goals).

In Table 3.3, we presented consensus supply elasticities. These findings affirm the need often expressed by policymakers for comparability and consistency. That is, recruiting success can be achieved in shifting markets and a changing economy if comparability with the civilian sector and consistency with the allocated recruiting mission are maintained in the following areas:

- Pay and benefits. Maintaining comparability (adjusted for inflation and shifts in civilian wage scales).
- Enlistment incentives. Providing a competitive incentives package (adjusted for inflation and comparability with incentives offered by academic institutions, training facilities, and civilian sector employers).
- Recruiting resources. Maintaining consistent levels of resources (allocating recruiter levels and Operations and Maintenance dollars, including advertising) allocated within a range of enlistment goals (rather than being adjusted annually based on past performance).
- Image of the Services. Sustaining over the long term, a positive image among the youth and general populations.

Research efforts should clearly ensure comparability and consistency in the above areas as a guiding principle in designing supply models and conducting analyses in the future.

## Chapter 4

### INFLUENCING THE MARKET

In the dictionary, influence is defined as a "power indirectly or intangibly affecting a person or course of events." Military recruiting jargon includes the term "influencer" - someone whom young men and women look to for advice, guidance, and example. Influencers may be teachers, guidance counselors, public officials, coaches, parents, other relatives, or close friends. One of the greatest challenges to the AVF concept was to overcome decades of popular opinion that the military was the "employer of last resort." Selling the military as a reasonable occupational alternative meant not only convincing age-eligible youth, but winning the approval of influencers.

In the transformation of military recruiting from a processing to a marketing organization, little was taken as a given. The Services had to demonstrate a need and prove effectiveness for nearly every facet of their recruiting programs. Something as simple as paid radio advertising was studied and analyzed before policymakers would make a move. It took 6 years and near failure before a sincere commitment to a marketing mode of operation was adopted. Over the past 10 years, military recruiting has become a leader in marketing and advertising research.

Although the direction and magnitude of the impact of recruiting programs may be obvious, the two billion dollars spent annually on military recruiting spurred policy makers to pursue precision in estimates of program effectiveness. Over the years, research has shown that recruiters, advertising, enlistment bonuses, educational incentives, alternative

term-of-service offerings, and recruiter aides all increase the supply of high quality recruits. At every juncture, marketing research guided policymakers in developing effective recruiting programs. In particular, the use of "experiments" to test programs has been invaluable to the development of successful implementations. Much of the success achieved in military recruiting was built on a foundation of research into the factors that influence the market.

This body of knowledge was divided into six categories:

- Service-specific advertising research.
- Comparison of Joint and Service-specific advertising.
- Enlistment incentives.
- Recruiter productivity.
- Production mix and resource allocation.
- Surveys of the enlistment process.

Sixty studies were reviewed under this chapter heading. Some studies included under Chapter 3, Identifying the Market, would have been equally relevant to this chapter. Many econometric models included variables that measure the impact of advertising expenditures, bonuses, and/or educational benefits.

## OVERVIEW OF RESEARCH CONTEXT

A brief overview of the background of "Influencing the Market" research is given. The dominant findings involved advertising, enlistment incentives, and resource allocation.

**Advertising.** Advertising is an effective means to increase the supply of high-quality recruits. However, proving this to Service and DoD staffs was far from straightforward.

First, the precise operation of advertising as an influencer of enlistments was not well understood. Does advertising have an immediate effect, a lagged effect, or both? Just how should advertising be measured -- dollars or impressions? The questions posed difficult problems for military manpower researchers. Early work (Morey & McCann, 1979) indicated that advertising had both an immediate and a delayed impact on number of enlistment contracts. This was confirmed in later work by RAND (Dertouzos, 1989). More importantly, the work by RAND established that the overall cost effectiveness of Army advertising was nearly equal to that of recruiters. Specifically, the marginal cost of recruiting a high-quality person through increased advertising was estimated to be between \$5,000 and \$6,000. The cost to achieve this same goal through increased numbers of recruiters was pegged at \$5,700.

*Enlistment incentives.* Since entering the all-volunteer environment, the Services have used incentives to attract high-quality youth. Some, such as guaranteed training or station-of-choice, were low or no cost and were easily implemented. However, more costly incentives needed solid proof of effectiveness. Policymakers called on the research community to design experiments that would substantiate the value of monetary enlistment incentives. Both post-service educational benefits (Veterans Educational Assistance Program [VEAP], Montgomery GI Bill, Army College Fund) and enlistment bonuses were proven effective in experimental situations prior to full implementation.

*Resource allocation.* Allocating recruiting resources is a top concern of operational recruiting managers. However, allocation implies the need for a solid understanding of the impacts of resource inputs. Past research suffered from attempting to do too much

at once. Specifically, researchers estimated forecasting equations and performed allocation algorithms simultaneously. Generally, the result was a flawed estimation model which led to implausible allocation recommendations. Future allocation research must insist on combining the talents of estimators and optimizers to ensure solid footing for allocation algorithms.

## SUMMARY OF RESEARCH FINDINGS

### Service-Specific Advertising Research

Service-specific advertising research tended to fall within three categories:

- Investigation of media habits of target market.
- Evaluation of specific elements of advertising programs.
- Measurement of advertising awareness.

In addition to in-house efforts, the Services also conduct research through their advertising agencies as a normal step in developing advertising themes. This activity includes diagnostic research used when developing ad campaigns, usually focus groups. The agencies also measure advertising awareness during the execution of a campaign wave. Much Service agency research is not published or publicly released. Thus, it was not available for review, but it is an important element in the body of military advertising research.

The primary goal of advertising is to communicate a message. Advertisers want to get that message to the target market. Research on media habits identifies the media most likely to reach high-quality youth. Syndicated research can identify media habits by



general demographic characteristics such as age, gender, education, and area of the country. However, only through custom surveys can researchers add the dimension of aptitude to the general dimensions.

Three studies investigated media habits of age-eligible youth. Two analyzed responses from the Army's New Recruit Survey. Specifically, an analysis of 1983 ARI Survey of Recruits identified media that reached high-quality recruits. It provided a guide to media most likely to reach the quality male market (Elig et al., 1985). In the second effort, analyses of 1984-1987 New Recruit Surveys identified media habits of recruits across AFQT test score ranges, level of education, race, gender, age, and region (Ashbury, 1988). Survey results pointed to differences in media habits by demographic characteristics, particularly in radio listening and television viewing habits. Differences were also detected between racial or gender groups.

However, recruits are a pre-screened sample. Looking solely at their responses may give biased estimates of the behavior of the youth population in general. To obtain a direct estimate of media habits of target high-quality youth, researchers analyzed responses to media habits questions posed to half of the respondents to the Army Communications Objectives Measurement System (ACOMS) survey administered between July and December 1987 (Elig, 1988). Of particular interest were comparisons between syndicated audience data and ACOMS data for target high-quality market. Researchers concluded that syndicated data understate the viewing habits of the prime military recruiting market (16-to-21 year olds). Differences from New Recruit Survey data were also noted for the ACOMS national probability sample.

The road to acceptance of paid advertising as a primary element of the recruiting program was long and rocky. At nearly every step, advertisers were directed to evaluate the advertising program. In 1975, an experimental study tested the effectiveness of paid radio advertising (Schuker, 1976). This early entry evaluated the use of designed experiments for recruiting programs. Unfortunately, the length of the experiment was short (4 months) and the findings in favor of paid radio were weak. Years later, RAND (Dertouzos, 1989) did not detect positive results for local paid radio advertising, but did find significant effects of national radio advertising.

Another study evaluated use of direct-mail for reaching a slightly older market (19-23-year-olds) for the Navy (Fernandez et al., 1983). Findings indicated that it was not effective. Direct mail remains an integral part of the Service advertising programs. Advertising managers indicate that it is cost effective at generating leads. However, no published research was found.

An important objective of advertising is to generate leads. One study (Morey, 1982) compared the cost effectiveness of Joint national, Navy national, and local leads. Using econometric models, Morey estimated the relationships between number of leads and high school graduate contracts. The resulting elasticities were combined with cost data to generate estimates of marginal costs for each lead-generating program. Results favored Navy-specific lead-generating programs. The work also indicated a high elasticity (.89) for local print media. The 1989 RAND work indicated that print was the most cost effective medium for national advertising.

Another important goal of advertising is to build awareness of the product. This goal can be achieved only if the advertising message reaches and is understood by the target audience. Awareness research is closely held by the advertising community. Only one published study (Gilkey, 1986) looked at the relationship between advertising awareness and enlistment propensity. Specifically, Army researchers performed a discriminant analysis of survey responses to measure the relationship. Awareness of GI Bill advertising was only a weak discriminator between those with a positive propensity to enlist and those without.

*Observations.* Three issues emerged from the review of the Service-specific advertising research. First, media habits research holds great promise to improve the efficiency of military advertising. What was not evident in the research was combining the media habits information with media cost to calculate cost effective media options. Is this next step the function of research or of operational advertising managers? What media habit information should be routinely gathered from recruit or youth population sources?

Second, evaluation of advertising and consumer habits (for both military and private sector clients) is widely done, but seldom disseminated. Should advertising agency research be more readily available to concerned military users? Should agencies be tasked as part of their contracts to provide results of non-military consumer research that would be of interest to DoD?

And last, military advertising awareness research is almost exclusively in the domain of YATS and surveys of new recruits. Is this enough? Should the upcoming YATS include more on advertising awareness?

It may be that military recruiting advertising research has reached a point where little can be gained from the laboratory; that is, adequate research has become a normal part of operations. Military advertising managers expressed the opinion that syndicated research is adequate to identify effective media. Differences in media habits between general and high-quality youth are viewed as too small to justify acquiring vast amounts of media habit data. In fact, the Army dropped nearly all of the media habits questions from the NRS. The new YATS questionnaire has far fewer items dealing with media habits than originally planned. The consensus during the project workshop supported the notion that media habits research was strictly an operational concern.

Greater sharing of agency research is generally desired by military users. However, some research is not suitable nor intended for public release -- for example, research aimed at highlighting faults, weaknesses, or past mistakes.

#### **Comparison of Joint and Service-Specific Advertising**

By its very nature, advertising is politically sensitive. Television advertising is expensive and highly visible to the public. It generates a lot of mail to Congress and the Administration. Since its inception, Joint advertising has been a source of controversy with the Services. Most controversy has revolved around the possibility of having only one source of TV advertising -- Joint.

As would be expected, the Services and DoD have sponsored efforts to identify which form of advertising is "best." The bulk of published research comparing Joint and Service advertising is associated with the Advertising Mix Test conducted by the Wharton School of Business at the University of Pennsylvania in FY 1984 (Carroll, 1987). Ad-Mix was a year-long designed experiment.

The Ad-Mix methods and results were subsequently reviewed by two separate organizations. The findings favoring Joint advertising were hotly contested by the Services. The Army asked Professors Abraham Charnes and William Cooper of the University of Texas to review the methodology. These researchers applied a relatively new technique called Data Envelopment Analysis (DEA) to Ad-Mix data, and reported potentially serious flaws in the model specification (Charnes et al., 1986). Their conclusions were directly opposite those of Carroll. DEA was also applied to Navy data with similar results.

DoD asked RAND to do an independent review of the Wharton work. RAND concluded that the evidence did not substantiate a preference on advertising source (Dertouzos, 1989). Both Joint and Service-specific advertising had positive effects, but they were not different in terms of cost effectiveness. Overall, the marginal cost of a high-quality contract was between \$2,000 and \$3,000 regardless of advertising sponsorship. From a Service-specific perspective, the Army would be indifferent; Joint and Army advertising were equally cost effective. The Navy would benefit slightly from a shift to Joint. While the Air Force and Marine Corps preferred their own advertising, Joint was equally effective in generating high-quality enlistment contracts. RAND concluded that the Services gain enlistments from advertising, regardless of the source, and that the gain

does not come at the expense of another Service. The study concluded that both Service and Joint advertising were powerful tools in recruiting.

Other comparisons of Service-specific and Joint advertising included:

- Using an econometric approach in two studies, researchers for the Navy compared the number and conversion rate of Navy versus Joint leads (Morey, 1984).
- In 1978, a test of the relative efficiency and effectiveness of Joint and Service magazine advertising was conducted (Grey Advertising, 1979).

Results leaned toward those who sponsored the work. This should not be interpreted as an indictment of the work, but a recognition that advertising does not have one accepted criterion. If RAND was right, both Joint and Service-specific ads are about equally effective. In such a situation, a slight change of criterion can lead one to conclude a slight advantage of one over the other.

The final study reviewed was a student research project (Koenig, 1984) which compared military advertising to that of major civilian companies. Unfortunately, Koenig was not successful in obtaining cooperation from private industry. He concluded that they may have been reluctant to support comparisons of their advertising strategies with those of the military. Project workshop participants believed that industry is willing to cooperate with the military and pointed to support of the Education-with-Industry programs.

**Observations.** The Ad-Mix Test was an ambitious attempt to answer the question of which is best -- Joint or Service advertising. In the final analysis, "Which is best" may not be a valid question. If the difference in effectiveness between Joint and Service advertising is so small as to be nearly undetectable, then a conclusion in favor of either

could have generated a damaging policy reaction. To some critics, this happened in 1987 when Service advertising was significantly reduced. If "which is best" is not the appropriate question for research, should it not be "How do Joint and Service advertising complement each other?"

The Ad-Mix experience demonstrated that a "shoot-out" mentality did not achieve a proper appreciation for the complex effects of advertising. Future research should be aimed at understanding the roles that each form of advertising plays in communicating to prospective recruits. For example, Joint advertising promotes military service as an attractive vocational choice; Army ads then strengthen this message and add Service-unique options. In the final analysis, the military may be communicating more effectively by having both complementary messages.

#### **Enlistment Incentives**

Enlistment incentives have become an integral part of military recruiting strategy. This was not always the case. The end of the Vietnam Era GI Bill and the sharp declines in recruit quality that followed in the late 1970s spurred renewed interest in targeted enlistment incentives. The typical lifecycle of an incentive program involved debate, followed by experimentation, and, if worthy, implementation. A wide variety of monetary and non-monetary incentive programs have been studied.

For many years, the educational benefits of the GI Bill compensated for the sacrifices of military service (low pay, involuntary separation). In a peacetime

environment, the cost of a universal GI Bill came under intensive scrutiny. The impact on recruiting of the loss of this benefit in 1977 was felt almost immediately.

With a renewed commitment to military manpower in the late 1970s came renewed interest in educational benefits. A 1979 Army War College study (Joy, 1979) suggested adoption of educational benefit strategies employed by our NATO allies. RAND described issues to consider in designing a field experiment to test alternative educational incentives (Fernandez, 1980). Later, RAND reported on the educational assistance test program conducted in FY 1981 (Fernandez, 1982). An Army Recruiting Command report (Phillips, 1986) described the criticality of maintaining an affordable GI bill.

Findings across studies indicated that properly structured educational incentives were a powerful and cost effective method to attract high-quality recruits. Used in combination with terms-of-service, educational incentives increase the supply of high-quality recruits and channel them to hard-to-fill specialties. Specifically, the supply effect of the GI Bill was between 8 and 11 percent. Although educational benefits were effective at expanding supply, the question of cost effectiveness was not addressed until recently. In an Army-sponsored study, researchers concluded that the Army College Fund (Smith et al., 1991) was cost effective at increasing the man-years of quality service compared with alternative methods of increasing compensation.

Reenlistment bonuses have long been used as an incentive to retain desired people in the military. It was only natural that they be considered to attract good people. A 1973 study (Barfoot et al., 1975) used survey data to estimate the impact of various enlistment incentives, including bonuses. Huck et al. (1976) evaluated the Army's bonus



program of the early 1970s. The enlistment bonus experiment of 1982 culminated separate research on bonus effectiveness (Pollich, et al., 1986).

Analyses of the impact of enlistment bonuses could not concentrate just on market expansion (supply) effects. They also have skill channeling and term-of-service effects. Findings showed that a widely available enlistment bonus program (\$4,000 for 3-year and \$8,000 for 4-year enlistments) would expand the supply of high-quality recruits by about 5 percent (Pollich, et al., 1986). In a more recent econometric analysis, Smith (1991) estimated that the effect of increasing the bonus program beyond its 1984 level was not statistically significant, suggesting that the bonus program cannot be justified solely on the basis of supply expansion. Smith did find a supply effect of a small bonus (\$1,500 per increased year of commitment) offered to a wide variety of specialties. Known as the "Bonus Buyup," it increased high-quality contracts by about 6 percent. In effect, the program was a small pay increase targeted to high-quality prospects who would agree to an increased term-of-service.

Product enhancements like the Army College Fund (ACF) and enlistment bonuses require funds. Obtaining funding for monetary incentives takes time. Meanwhile, the Services had to look for ways to make the product more appealing. Among these were guaranteed job training, shorter terms of enlistment, and stations of choice. Research confirmed their effectiveness. Indeed, job training guarantees can be a powerful and inexpensive enlistment option. However, not everybody can be trained to be computer programmers or electronic technicians when what you need are tankers and mechanics. The Services have their own policies with regard to guaranteed job training. As of this

writing, Army enlistees are guaranteed training in an occupational specialty, while about half of the Navy and Air Force recruits know their specialty at contract. The Marine Corps offers few job training guarantees.

Shorter enlistment periods (2 years) were also studied (Horne et al., 1988). Findings showed that 2-year enlistment options increase the supply of high-quality recruits to the Army and are cost effective.

*Observations.* Monetary incentives lose value due to inflation. This is particularly applicable for the ACF, as the cost of college has increased substantially faster than the cost of living. Most research applies to a fixed program level. Has inflation eroded the attractiveness of the Army College Fund and the GI Bill? What would be needed to keep pace? The Army was concerned that inflation had eroded the attractiveness of the ACF. Recent econometric results (Goldberg, 1990) suggest that the supply effect of the ACF had declined due to inflation. The Army was granted authority to increase the maximum level of the ACF to \$36,000. Due to reduced accession goals, the Army has not implemented the higher ACF levels. However, now may be the opportunity to test the effectiveness of the enhanced benefits. Research should include an experiment to test the \$36,000 ACF.

Analysts suggest that enlistment bonuses have not been as effective as possible for two reasons. First, the availability of bonuses is not advertised. Second, they are available to a rather narrow range of specialties. The Army enhanced bonus program offered a small bonus to a wide number of specialties which could have a substantial supply effect, as well as increase average term-of-service. Should this program be studied more closely?

## Recruiter Productivity

The recruiter is the linchpin to recruiting success. A trained and motivated recruiting force is essential to meeting long-term recruiting goals. The objective of recruiter productivity research was to investigate ways to improve the efficiency of recruiting's most precious resource, the field recruiter.

The Center for Naval Analyses and RAND evaluated the Freeman Plan incentives in terms of equity across regions. (Cooke, 1986; Asch, 1990) Researchers were primarily concerned with the question, "Is a fixed award system (e.g., 5 points per contract regardless of location) equitable given differences between markets?" Findings suggested that the system may be counterproductive if recruiters view it as inequitable. Researchers suggested that incentives should be both relative to goals and other recruiters in a region.

### Other studies included:

- As part of a comprehensive Navy field marketing experiment, Carroll (1982) investigated the impact of experience on productivity. Not surprisingly, recruiter productivity increases with experience. A plateau is reached and maintained for 2 to 3 years. Productivity drops precipitously a couple of months before rotation.
- Three efforts (Fernandes, 1983; Fetko, 1985; Hertzbach et al., 1985) studied the effectiveness of and attitude toward hometown recruiter assistants, a program wherein recruits return to their hometown after training for a short period to assist recruiters. The Navy test of the concept in 1980/81 was canceled early in the effort. The Army also evaluated it in 1981. Results pointed to the need for careful involvement of local recruiters in the selection of participants.
- Hosek and Peterson (1990) investigated differences in enlistment motivation in men and women using micro-level data from the NLS and AFEES surveys. Findings indicated that men's and women's enlistment decisions were affected by the same factors and often in the same way. Differences were evident in the weaker impact of labor conditions on women and the higher negative impact of future marriage plans on women.

*Observations.* It is surprising how few research efforts have concentrated on recruiter productivity, particularly as it relates to recruiter incentives (e.g., trophies or promotions). Is it a matter only for operational managers or is there a useful role for research? Factors that affect recruiter productivity have received little research attention. Should they? Is this wrapped-up with recruiter selection and training research?

Project workshop participants agreed that a better understanding of the role and effectiveness of competition incentives was needed. However, like goaling, a competition system should be updated at least annually, and frequently more often. Meeting these operational constraints requires that competition incentives remain in the hands of operational managers. However, independent review of competition incentive structures across and within Services would be beneficial.

The bulk of recruiter productivity effort has been associated with recruiter training and development. The Services have identified what it takes to be a successful recruiter. Sales is a demanding job. Each individual must adapt the toolbox to his or her strengths. Investments in recruiter productivity would be more appropriate as part of a job analysis or recruiting techniques project rather than market research.

#### **Production Mix and Resource Allocation**

A primary concern of recruiting managers is the allocation of goals/missions. Unfortunately, no published research dealt directly with goal allocation. Related topic areas included under this heading were inter-Service and inter-Component effects. The Navy field marketing experiment investigated factors directly related to production capacity

(Carroll & Rao, 1982). Recruiters, goals, advertising, and Delayed Entry Program (DEP) position all influenced enlistment contract production. Numerous econometric studies have confirmed the findings of the early Navy work. For example, a Clemson University study (Warner, 1987) used econometric techniques to estimate cross-Service effects of recruiters. Evidence of cross-Service effects was mixed.

Efficient use of resources is a primary goal of any competitive organization. Recruiting is a highly competitive operation for the Military Services. As such, efficient use of recruiting resources is a much studied subject. Research objectives in this category were to develop models and investigate the optimal allocation of recruiting resources. All but one title represented the work of Dr. Richard Morey. His work combines econometric estimation with production models to estimate efficient allocation, focusing on a limited set of issues. Morey's earlier efforts for the Navy broke new ground in both methods and data -- particularly his work on estimating the lagged effect of advertising. Specific issues included trade-offs between recruiters and advertising, DEP management, advertising media, and enlistment incentives (Morey et al., 1978, 1979, 1980, 1982, 1983, 1985, 1986, 1987, 1989).

Cooke (1988) investigated how to reallocate recruiters between recruiting areas. Results indicated that changing population and economic patterns require a planned response in allocation of recruiting resources and recruiters.

Barnes (1990) developed a prototype system to trade-off Army recruiting resources to achieve a quality enlistment objective. With no other constraints, recruiters and advertising would be the most cost effective choices for increasing supply. Greater

coverage across specialties of the ACF would be the next preferred alternative. Bonuses and increased compensation are the most expensive alternatives to increase supply.

**Observations.** Goal allocation is important in recruiting management. Why has so little been published on the subject? Should more applied research be conducted? Resource allocation is extremely sensitive to elasticity estimates. With new techniques such as Data Envelopment Analysis (DEA), accurate estimates of environmental and resource variables are needed to ensure reasonable allocation recommendations. Should future studies force the collaboration of estimation and optimization experts?

Project workshop participants indicated that the models underlying the missioning/goaling procedures had borrowed heavily from the research literature. However, missioning/goaling is an on-going management process. It must be flexible and responsive to management needs. Research can play a valuable role, particularly in the collection of better local area data and the formulation of more accurate forecasting models. There was general agreement among workshop participants that a multidiscipline approach to allocation research was best.

### **Surveys of the Enlistment Process**

Studies used survey data to gain insight into the process that influences youth to enlist in a military service. Two reports from the Navy Enlistment Field Marketing Experiment were included (Carroll et al., 1982). One involved the administration of a survey to youth and to applicants at stages in the enlistment process. The other involved analyses of survey data to determine homogenous clusters of applicants and motivations.

Research findings showed:

- Employment needs rank high as an enlistment motivator. Those out of school and out of work continued to the next step in the enlistment process at a higher rate.
- Women progress from recruiter contact to applicant status at about half the rate of men.
- Furthering education is a life goal of nearly three quarters of respondents.
- Of the top life goals (job security and opportunity for self-development), the military is not perceived as best able to satisfy these goals.
- Segmentation methods were only moderately successful at identifying life-goal characteristics of enlistees.

### CONCLUSIONS ON INFLUENCING THE MARKET

Much research has measured the outcomes of recruiting programs and environmental variables. However, little has been attempted to understand the process. Would research concentrating on the recruiting process as it relates to enlistment outcomes be of value? Behavioral research into the enlistment decision process has suffered from a lack of solid areas of application. Perhaps private sector research could point a direction for useful applications in this area.

Over the last decade, the military has been very successful in influencing high-quality young men and women to enlist. Market research played an important role in establishing the efficacy of advertising, educational benefits, and monetary bonuses in promoting bright youth to join. Since 1980, the application of marketing principles to military recruiting has come of age.

Recruiting managers will face a very different set of problems over the next 10 years. Planned downsizing of the military, combined with overall budget pressure for deficit reduction, portends significant reductions in recruiting resources. With the reductions will come renewed interest in resource allocation and productivity initiatives.

Past market research has suffered from a lack of direct utility. Future work must incorporate sound research with software technology to produce recruiting management tools. Doing more with less will be the challenge of recruiting in the 1990s. Creative and practical use of information technology is a key to meeting this challenge.



## Chapter 5

### RECOMMENDATIONS AND CONCLUSIONS

Transitioning the military establishment to a large peacetime standing force wholly through volunteers was challenging and complex. Recruiting shifted from a fairly simple mode in which youth, under pressure of conscription, actively sought out recruiters to a complex mode in which the Services' recruiting commands had to compete for a diminishing pool of youth who had many options and no pressure to lead them to recruiters.

Recruiting managers drew extensively on the tools of private sector marketing to stimulate the supply of volunteers. The literature on the relative contributions of advertising and a sales force when marketing an intangible, high risk, once-purchased product influenced the structure of the recruiting effort. Planners borrowed from private sector marketing theory, practice, and expertise. The rudiments of a military manpower market research program began to examine the enlistment decision process and evaluate recruiting and advertising activities.

Increasingly more sophisticated market research techniques have been used to improve understanding of market conditions, competitive dynamics, and the desires of prospective recruits. OSD and the Military Services examined the supply and demand sides of the marketplace; the relationship between them; the impact on supply of changes within the monetary and non-monetary aspects of the product; demographic and psychographic (or lifestyle) patterns of various segments of the marketplace; quantitative

and qualitative communications research; and comparative performance among the Services.

There is no doubt that military market research played a major role in improving military recruiting success over the last two decades. It brought together the disaggregated body of market research information to create a better understanding of what that total body of knowledge could offer the research and user communities. This project has highlighted the level of effort, particularly on the part of the Army, in gathering market information. The research has been high quality. Most recommendations, therefore, focus on more global issues about the body of research as a whole and on directions for future work.

### **Recommendations**

To enhance an already effective market research program, the project team recommends the market research program be modified regarding the analytic process and approach, areas to be reviewed and applications of findings. Recommendations include:

#### **Analytic Process and Approach**

- Describe variable construction and rationale in sufficient detail to be replicated.
- Explain the theoretical model and underlying assumptions from which model specifications and functional forms are derived.
- Describe the rationale for using increasingly complex models and data structures and demonstrate their marginal benefits when compared with simpler formulations.
- Include sufficient statistics to allow thorough evaluation by technical readers.

- Report confidence bands for elasticities and supply projections. Allow for increased uncertainty as the time horizon of projections increases.
- Use more sophisticated statistical techniques (e.g., regression analysis, factor analysis) to understand the underlying dimensions or theory behind the data, as opposed to simply reporting percentages.
- Ensure that researchers make use of a basic set of explanatory variables in future studies of enlistment supply. At a minimum, the model should include unemployment, relative pay, recruiters, Service missions, and measures of advertising and benefit effectiveness.
- Compile and maintain a consistent data set at the basic recruiting organization level and formulate more accurate forecasting models. These data would form the basis for testing new estimation methods or adding new explanatory variables.
- Encourage a multidiscipline approach to allocation research.

#### Research Areas

- Focus on depth rather than breadth of data collection, in contrast to answering all questions in every survey (e.g., restrict the Fall wave of YATS to the vocational decision process, propensity, values, and perceptions; and the Spring wave to media habits and advertising awareness/effectiveness).
- Conduct more subgroup analyses on important market segments (e.g., low-propensity youth, women, minorities, immigrants, and health professionals).
- Conduct more research on the vocational choice decision process, possibly by surveying younger youth.
- Assess the implications of a more structured survey of new recruits as opposed to surveys of the general population.
- Reconsider the place of veteran data in understanding initial enlistment motivations.
- Conduct more focused work on Reserve Component recruiting.
- Aim future advertising research at gaining a better understanding of the roles that advertising plays in communicating to prospective recruits, rather than just measuring the effectiveness of advertising on producing enlistment contracts.

- Analyze the impact of inflation on educational and monetary incentives. Specifically, conduct an experiment to test the \$36,000 Army College Fund (ACF) and the impact of a small (\$1,000-\$3,000), but widely available, enlistment bonus.

#### Application

- Prepare an executive summary in non-technical language for all market research reports.
- Accelerate reporting and disseminating survey findings.
- Expedite the transition from laboratory to the field. Future work should incorporate sound research with software technology to produce practical recruiting management tools.

### CONCLUSIONS

Reliable and accurate market information has been the basis for marketing strategy, evaluation of pricing alternatives, product development, promotion, and placement of resources. It has aided in setting objectives and provided the analytic basis for meaningful evaluation of marketing programs. Market research has been used to formulate policy, evaluate program effectiveness, design new product offerings (e.g., enlistment terms, programs, bonuses, college fund), and allocate recruiters, goals, and advertising support. It also has provided support to defend recruiting programs in the congressional authorization and appropriations process.

It is critical for the Department of Defense to sustain a strong market research effort. The recommendations in this and the associated management report should assist OSD and the Services as they strive to enhance recruiting effectiveness in an environment of "do more with less." Valid, current information on the target market is the key ingredient in accomplishing that objective.

## REFERENCES

- Armstrong, T.R., Farrell, W.S., & Card, J.J. (1979). Subgroup differences in military-related perceptions and attitudes (ARI RR-1214). Palo Alto, CA: American Institutes for Research.
- Ashbury, J. (1988). Four years of media habits: Implications for U.S. Army advertising to the prime market (ARI-RR-1500). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
- Associates for Research in Behavior Inc. (1980). Issues related to recruitment of enlisted personnel for the reserve components. Major findings and recommendations. 1979 tracking study. Volume I. Philadelphia, PA: Author.
- Barfoot, C.B., Sims, W.H., & Klein, S.W. (1975). Marine Corps enlistment guarantee study. (CNS 1056). Arlington, VA: Center for Naval Analyses, Marine Corps Operations Analysis Group.
- Barnes, J. (1990). The Army recruiting resourcing system (FR-90-33). Alexandria, VA: HumRRO International, Inc.
- Becerra, R.M. (1983). An assessment of college market spring-summer 1980 (DMDC/SMAD TR-15). Los Angeles, CA: California University Institute for Social Science Research.
- Benedict, M.E. (1988). A comparison of survey length with reading difficulty and selected recruit characteristics for the 1987 USAREC survey of active Army recruits. Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
- Benedict, M.E. (1987). The 1986 ARI survey of U.S. Army recruits: Technical manual (ARI TR-735). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
- Boesel, D.P., & Richards, J.A. (1983). Enlistment motivation in the all volunteer force environment: A review of major surveys. Alexandria, VA: Defense Manpower Data Center.
- Borack, J.I. (1982). The intentions of men 23 to 29 years old to join the military: Results of a national survey (NPRDC-TR-82-62). San Diego, CA: Navy Personnel Research and Development Center.
- Borus, M.E., Kim, C., & Johnson, K. (1985). Policy findings related to military service from the youth cohort of National Longitudinal Surveys of labor market experience

(DMDC/SMAD TR-12). Columbus, OH: Ohio State University, Center for Human Resource Research.

Brown, C. (1985). Military enlistments: What can we learn from geographic variation? American Economic Review, pp. 228-234.

Buddin, R. (1984). Estimation of AFEES survey weights (N-2072-MIL). Santa Monica, CA: RAND Corporation.

Burk, J. S., & Faris, J. H. (1982). The persistence and importance of patriotism in the All-Volunteer Force (USAREC SR-82-6). Columbus, OH: Battelle Memorial Institute.

CACI, (1984). Alternatives to the current level and mix of enlisted, active force recruiting advertising. Arlington, VA: Author.

Carroll, V. P. (1987). Department of Defense advertising mix test. Comparison of Joint-Service with Service-specific strategies and levels of funding. Philadelphia, PA: Wharton Applied Research Center.

Carroll, V. P., Lee, H. L., Lipson, D. P., & Rao, A. G. (1982). The Navy enlistment field marketing experiment. Volume V. The Wharton-administered Navy tracking survey: Pre-intervention recruiting environment (TR-5). Philadelphia, PA: Wharton Applied Research Center.

Carroll, V. P., & Rao, A. G. (1982). The Navy enlistment field marketing experiment. Volume I: Executive overview and summary (TR-1). Philadelphia, PA: Wharton Applied Research Center.

Carroll, V. P. (1982). The Navy enlistment field marketing experiment. Volume III. An empirical investigation of Navy recruiter productivity (TR-3). Philadelphia, PA: Wharton Applied Research Center.

Carroll, V. P., Bayus, B. L., Lee, H. L., & Rao, A. G. (1982). The Navy enlistment field marketing experiment. Volume VII. The Wharton administered Navy tracking survey: A segmentation approach (TR-7). Philadelphia, PA: Wharton Applied Research Center.

Celeste, J. F., Wilson, M. J., Ramsey, V. F., Elig, T. W., & Pliske, R. M. (1986). The 1984 and 1985 ARI survey of Army recruits: Methodology and recommendations for future administrations (TR-706). Rockville, MD: Westat, Inc.

Center for Human Resource Research/Ohio State University. (1988). National longitudinal survey bibliography update. Columbus, OH: Author.

Center for Human Research/Ohio State University. (1988). The national longitudinal surveys of labor market experience (NLS) handbook. Columbus, OH: Author.

Charnes, A., Cooper, W. W., Galony, B., & Brockett, P. (1986). Critique of FY 1984 advertising mix test of Wharton Center for Applied Research (CCS RR-546). Austin, TX: Texas University Center for Cybernetic Studies.

Charnes, A., Cooper, W. W., & Galony, B. (1986). Relative effects by data envelopment analysis of Service-specific and Joint national advertising in recruiting activities. Austin, TX: Texas University Center for Cybernetic Studies.

Cooke, T. W. (1988). Recruiting resources and policies (CRM-88-27). Alexandria, VA: Center for Naval Analyses, Navy-Marine Corps Planning and Manpower Division.

Cooke, T. W. (1986). Individual incentives in Navy recruiting (CRM 86-269). Alexandria, VA: Center for Naval Analyses, Naval Planning, Manpower, and Logistics Division.

Crossley Surveys Inc. (1986). Measuring advertising awareness of the New GI Bill. New York, NY: Author.

Crossley Surveys Inc. (1986). Changes in the propensity to enlist over time among quality prospects (USAREC SR-86-9). New York, NY: Author.

Data Recognition Corporation. (1989). The 1988 USAREC new recruit survey technical manual. Minneapolis, MN: Author.

Data Recognition Corporation (1987). The 1987 USAREC new recruit survey technical manual. Minneapolis, MN: Author.

Daymont, T. N. & Andrisani, P. J. (1986). The economic returns to military service (USAREC SR-86-11). Philadelphia, PA: Temple University, Center for Labor and Human Resource Studies.

DeReu, J.A. & Robbin, J.E. (1981). Application of geodemographics to the Army recruiting problem. Chicago, IL: U.S. Army Recruiting Command.

Dertouzos, J.N. (1989). The effects of military advertising: Evidence from the advertising mix test (N-2907-FMP). Santa Monica, CA: RAND Corporation.

Dertouzos, J.N., Polich, J.M. (1989) Recruiting effects of Army advertising (R-3577-FMP). Santa Monica, CA: RAND Corporation.

Doering, Z. D., Grissmer, D. W., & Morse, J. S. (1980). 1979 DoD survey of personnel entering military service: Wave 2 user's manual and codebook (N-1605-MRAL). Santa Monica, CA: RAND Corporation.

Doering, Z. D. (1979). Rand DoD survey research program, fiscal years 1978-79 (N-1 1 6 5 MRAL). Santa Monica, CA: RAND Corporation.

Elig, T. W., Perry, M. S., & Wilson, M. J. (1989). An expectancy theory model of initial career decisions. Prepared for the 1989 Conference of the Military Testing Association. San Antonio, TX. November 9, 1989.

Elig, T. W. (1989). Advertising and (youth and parental) perceptions of the armed forces. Paper presented at the American Psychological Association 97th Annual Convention. New Orleans, LA. August 1989.

Elig, T. W. (1989). Views of U.S. youth on military service and college enrollment as alternatives to full-time employment. Prepared for the 1989 Biennial Conference of the Inter-University Seminar on Armed Forces and Society. Baltimore, MD. October 27-29, 1989.

Elig, T. W. (1988). Targeting the delivery of Army advertisements on television. Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Elig, T. W., Weltin, M. M., Hertzbach, A., Johnson, R. M., & Gade, P. A. (1985). U.S. Army advertising from the recruits' viewpoint (ARI RR-1407). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Elig, T. W. (1988). Targeting the delivery of Army advertisements on television (RR 1484). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Elig, T. W., Hertzbach, A., & Johnson, R. M. (1984). The 1983 Department of the Army survey of personnel entering the Army: Tabular description of 1983 (active) Army accessions. Volume 2 (RP-84-02). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Elig, T. W., Johnson, R. M., Gade, P. A., & Hertzbach, A. (1984). 1982 Department of the Army survey of personnel entering the Army: Accessions, Volume 1. Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Elig, T. W., Johnson, R. M., Gade, P. A., & Hertzbach, A. (1984). The Army enlistment decision: An overview of the ARI recruit surveys, 1982 and 1983 (RR 1371). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Elig, T. W., Gade, P. A., & Shields, J. L. (1982). The 1982 DA (Department of the Army) survey of personnel entering the Army. Paper presented at the meeting of Military Testing Association. San Antonio, TX. November, 1982.



Fernandes, K., Romanczuk, A. P., Goodstadt, B. E., & Colby, C. L. (1983). Evaluation of a tailored direct-mail marketing strategy for recruiting the 19- to 23-year-old market (NPRDC SR-83-38). Rockville, MD: Westat, Inc.

Fernandes, K. (1983). Evaluation of the Navy's recruiting assistance program as a peer networking strategy for recruiting the 19-to 23-year old market (NPRDC-SR-83-11). San Diego, CA: Navy Personnel Research and Development Center.

Fernandez, R. L. (1982). Enlistment effects and policy implications of the educational assistance test program (R-2935-MRAL). Santa Monica, CA: RAND Corporation.

Fernandez, R. L. (1980). Issues in the use of postservice educational benefits as enlistment incentives (N-1510-MRAL). Santa Monica, CA: RAND Corporation.

Fetko, L. L. (1985). Attitudes toward the hometown recruiter assistance program: A discriminant analysis (USAREC RM-85-01). Fort Sheridan, IL: U. S. Army Recruiting Command.

Finnessy, M. L. (1984). Enlistment behavior and motivation: Age group comparisons (USAREC-RM 84-05). Fort Sheridan, IL: U. S. Army Recruiting Command.

Fisher, A. H., Jr., & Rigg, L. S. (1974). The endorsement of enlistment incentives (CR-D7-74-131). Alexandria, VA: Human Resources Research Organization.

Fredland, J. E., & Little, R. D. (1982). Socioeconomic characteristics of the all-volunteer force: Evidence from the national longitudinal survey. Annapolis, MD: U. S. Naval Academy.

Gaertner, G. H. & Elig, T. W. (1988). The Army communications objectives measurements system (ACOMS): Survey analysis plan (ARI TR-786). Rockville, MD: Westat, Inc.

Gilkey, P. E. (1986). The Army's GI Bill advertising awareness survey: A discriminant analysis (USAREC-RM-86-2). Fort Sheridan, IL: U. S. Army Recruiting Command.

Glickman, A. S., Korman, A. K., Goodstadt, B. E., Frey, R. L., & Romanczuk, A. P. (1973). A study of experimental incentives as an influence on enlistment intention. (AIR-32201-12/73-TM-2). Silver Spring, MD: American Institutes for Research.

Goldberg, L. (1991). Recent estimates of enlistment supply models. Reston, VA: Econometrics Research Laboratory, Inc.

Gorman, L., & Thomas, G. W. (1989). An analysis of enlistment motivations for United States Army Reserve Recruits (MIPR 87-55). Monterey, CA: Naval Postgraduate School.

Gray, R. L. (1987). Influences of high quality Army enlistments. Monterey, CA: Naval Postgraduate School.

Grey Advertising Inc. (1979). Joint service magazine advertising test. Spring 1978. New York, NY: Author.

Haggstrom, G. W., Blaschke, T. J., Chow, W. K., & Lisowski, W. (1981). The multiple option recruiting experiment (R-2671-MRAL). Santa Monica, CA: RAND Corporation.

Hay, M. S. (1989). Sample representativeness in the new recruit surveys: Seasonality effects (TR 917). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Hertzbach, A., Elig, T. W., Gade, P. A., Siebold, G. L. Eaton, N. K., & O'Hara, J. W. Assessment of the hometown recruiter assistance program. Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Horne, D. K., Pliske, R. M., & Gilroy, C. L. (1988). The Army 2-year enlistment option: Measuring its cost-effectiveness (ARI TR-790). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Hosek, J. R., & Peterson, C. E. (1990). Serving her country: An analysis of women's enlistment (R-3853-FMP). Santa Monica, CA: RAND Corporation.

Hosek, J. R., & Peterson, C. E. (1985). Enlistment decisions of young men (R-3238-MIL). Santa Monica, CA: RAND Corporation.

Hosek, J. R., & Peterson, C. E. (1983). The AFEES-NLS (Armed Forces Entrance and Examination Station-National Longitudinal Survey) database: A choice-based sample for studying enlistment and post-enlistment outcomes (N-1930-MRAL). Santa Monica, CA: RAND Corporation.

Hosek, J. R., Peterson, C. E., & Eden, R. A. (1986). Educational expectations and enlistment decisions (R-3350-FMP). Santa Monica, CA: RAND Corporation.

Huck, D. F., Midlam, K. D., Arms, R. L., Maloney, M. J., & Mulrooney, C. F. (1976). An evaluation of the effectiveness of the US Army enlistment bonus volume 1 (OAD-CR-154). McLean, VA: General Research Corp, Operations Analysis Division.

Huzar, C. E. (1988). Profiling market potential for navy recruiting at the local geographical level. NPGS Thesis. Monterey, CA: Naval Postgraduate School.

J. Walter Thompson. (1989). United States Marine Corps awareness and image tracking research. Atlanta, GA: Author.

Joy, J. R. (1979). New incentives for enlistment in the all-volunteer force. Carlisle Barracks, PA: Carlisle, PA: U. S. Army War College.

Kaplan, R. L., & Harris, P. T. (1986). The measurement of student attitudes toward possible recruiting incentives and career opportunities (USAREC SR-86-4). McLean, VA: Rumson Corporation.

Kaplan, R. L., & Harris, P. T. (1983). The measurement of high school students' attitudes toward recruiting incentives (USAREC SR-83-1). McLean, VA: Rumson Corporation.

Kim, C. (1983). A longitudinal study of enlistment in the armed forces with special reference to the effect of intentions on behavior. Columbus, OH: Ohio State University, College of Administrative Science.

Kim, C. (1982). The all-volunteer force: 1979 NLS (National Longitudinal Surveys) studies of enlistment intentions to serve, and intentions to reenlist (SMDC/SMAD TR-11). Columbus, OH: Ohio State University, Center for Human Resource Research.

Kim, C. (1982). Youth and the military service: 1980 national longitudinal survey studies of enlistment, intentions to serve, reenlistment and labor market experience of veterans and attriters (DMDC/SMAD TR-10). Columbus, OH: Ohio State University, Center for Human Resource Research.

Kim, C., Nestel, G., Phillips, R. L., & Borus, M. E. (1980). The all-volunteer force: An analysis of youth participation, attrition, and reenlistment. Columbus, OH: Ohio State University, Center for Human Resource Research.

Kiplinger, V. L., Boesel, D. P., & Johnson, K. T. (1985). Propensity of young women to enlist in the military. A report to the Congress (DMDC/77MRB TR-85-4). Alexandria, VA: Defense Manpower Data Center.

Klopp, G. (1986). Comparison of media inflation and Army recruiting advertising expenditures. (USAREC SR-86-1). Alexandria, VA: U. S. Army Chief of Staff for Personnel.

Klopp, G. A. (1982). Analysis of reserve market survey (USAREC SR-82-2). Fort Sheridan, IL: U. S. Army Recruiting Command.

Kocher, K., & Thomas, G. W. (1988). The Reserve intentions of active duty Army nurses (NPS-54-88-012). Monterey, CA: Naval Postgraduate School.

Koenig, R. F., Jr. (1984). Advertising strategies: Corporate and product-specific (ACSC-84-1475). Maxwell Air Force Base, AL: Air Command and Staff College.

Kralj, M. M., Adelman, L., Wilson, M., McTeigue, R. J., & Zirk, D. A. (1987). (ARI RN-87-61). Modeling the individual enlistment decision: Phase I final report. Reston, VA: PAR Government Systems Corporation.

Laurence, M.T. and Bridges, S.T. (1985). Youth attitudes tracking study: Historical evolution and characteristics. Arlington, VA: Defense Manpower Data Center.

Levine, E. L. (1987). The 1986 ARI (Army Research Institute) survey of U.S. Army recruits: Survey administration (ARI RN-87-57). Triangle Park, NC: Battelle Columbus Laboratories.

Lockman, R. F., & Curran, L. E. (1984). The missing link in Department of Defense recruit attainability projections. Alexandria, VA: Center for Naval Analyses.

M. J. Kimmel (1988). The Army Experience: A Good Place to Start? For publication at the American Psychological Association 96th Annual Convention. Atlanta, GA. August 12-16, 1988.

Market Facts Inc. (1982). A marketing study on the recruitment and retention of black-American and women cadets. Part I. Qualitative research summaries (JN 6409). Washington, DC: Author.

Mayas, J. B., & Smith-Waison, M. O. (1980). Male black college students: Their views of the Navy and characteristics of a Navy career (NPRDC SR-81-4). Washington, DC: Lawrence Johnson and Associates Inc.

McTeigue, R. J., Kralj, M. M., Adelman, L., Zirk, D. A., & Wilson, M. (1987). Predecisional processes involved in the enlistment decision. Reston, VA: PAR Government Systems Corporation.

Morey, R. C. (1989). Costing out quality changes: An empirical analysis of U.S. Navy enlistments. Cincinnati, OH: University of Cincinnati.

Morey, R. C. (1987). Impacts of size, composition and compactness of the delayed pool on enlistment contract production: Efficient allocation of recruiting expenditures and optimal DEP management. Cincinnati, OH: University of Cincinnati, Center for Applied Business Research.

Morey, R. C. (1985). Trading off recruiter field level support versus advertising: A budget building model incorporating optimized recruiter allocation and contract goaling (ONR-389-2). Durham, NC: Duke University, Center for Applied Business Research.

Morey, R. C. (1984). Joint DoD versus Navy specific lead generation advertising: Comparison of conversion rates to quality enlistments and marginal costs (TR-389-1-ONR). Durham, NC: Duke University, Center for Applied Business Research.

Morey, R. C. (1983). Estimating differences in area-level impacts of various recruiting resources: can different recruiting areas and years be pooled? (ONR-200-10). Durham, NC: Duke University, Center for Applied Business Research.

Morey, R. C. (1983). Leads and quality enlistments: The relative impacts of Joint and Navy specific advertising on production of upper mental, HSDG (high school degree graduate), male, Navy enlistments (ONR-200-9). Durham, NC: Duke University, Center for Applied Business Research.

Morey, R. C. (1982). Comparison of the marginal cost-effectiveness of various recruiting resources for high school graduate enlistments: Analyses of national, local and "walk-in" leads and yield rates (ONR-200-7). Durham, NC: Duke University, Center for Applied Business Research.

Morey, R. C. (1982). Management of the armed services' delayed entry pools: A comparison of recruiting philosophies and issues (ONR-200-9). Durham, NC: Duke University, Center for Applied Business Research.

Morey, R. C. (1980). The impacts of various types of advertising media, demographics, and recruiters on quality enlistments: Results from simultaneous and heteroscedastic models (TR-N-1). Durham, NC: Duke University, Center for Applied Business Research.

Morey, R. C. (1978). Overview of Duke University's efforts to optimize advertising and recruiter expenditures. Durham, NC: Duke University, Center for Applied Business Research.

Morey, R. C., & Lovell, C. A., (1986). A prototype model for allocating Army enlistment incentives: A feasibility phase (USAREC SR-86-3). Alexandria, VA: Defense Logistics Agency, Battelle Columbus Laboratories.

Morey, R. C., & McCann, C. (1979). Budget allocation and enlistment prediction models for the Navy's recruiting command: The proper balance between recruiters and advertising efforts. Durham, NC: Duke University, Center for Applied Business Research.

Nieva, V. F., & Elig, T. W. (1988). The Army communications objectives measurement system (ACOMS): Survey design (ARI TR-785) Rockville, MD: Westat, Inc.

Nieva, V. F., Rhoads, M. D. & Elig, T. W. (1988). The Army communications objectives measurement system (ACOMS): Survey methods. (ARI TR-787). Rockville, MD: Westat, Inc.

Nieva, V. F., Gaertner, G. H., Elig, T. W., & Benedict, M. E. (1988). The Army communications objectives measurement system (ACOMS): Annual report, school year 86/87 (ARI TR-784). Rockville, MD: Westat, Inc.

Nord, R. D., Schmitz, E. J., & Weiland, T. A. (1986). Propensity and the enlistment decision (ARI TR-723). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Orvis, B. R. (1986). Relationship of enlistment intentions to enlistment in active duty services (N-2411-FMP). Santa Monica, CA: RAND Corporation.

Orvis, B. R. (1984). Analysis of youth cohort enlistment intention data: progress report (N-2076-MIL). Santa Monica, CA: RAND Corporation.

Orvis, B. R. (1982). Forecasting enlistment actions from intention information: Validity and improvement (N-1954-MRAL). Santa Monica, CA: RAND Corporation.

Orvis, B. R., & Gahart, M. T. (1989). Quality-based analysis capability for national youth surveys (R-3675-FMP). Santa Monica, CA: RAND Corporation.

Orvis, B. R., & Gahart, M. T. (1985). Relationship of enlistment intention and market survey information to enlistment in active duty military service (N-2292-MIL). Santa Monica, CA: RAND Corporation.

Orvis, B. R., Gahart, M. T., Ludwig, A. K., & Schutz, K. F. (1989). Validity and usefulness of enlistment intention information (R-3775-FMP). Santa Monica, CA: RAND Corporation.

Ostrove, N. M., Bray, R. M., Guess, L. L., Dunteman, G. H., & Theisen, A. C. (1988). Youth attitude tracking study II, wave 18--fall 1987. Research Triangle Park, NC: Research Triangle Institute.

Palomba, C. A. (1983). U.S. Marine Corps enlistment bonus program (CNR-34). Alexandria, VA: Center for Naval Analyses, Marine Corps Operations Analysis Group.

Phillips, R. L. (1986). A critical element of Army recruiting strategy. An affordable G.I. Bill (USAREC SR-86-5). Fort Sheridan, IL: U. S. Army Recruiting Command.

Pliske, R. M., & Adelman, L. (1985). Development of tools for the measurement of enlistment decision variables (ARI 85-14). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Pliske, R. M., Elig, T. W., & Johnson, R. M. (1986). Towards an understanding of Army enlistment motivation patterns (ARI TR-702). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

Polich, J.M., Dertouzos, J.N., & Press, S.J. (1986). The enlistment bonus experiment (R-3353-FMP). Santa Monica, CA: RAND Corporation.

Polich, J. M., Fernandez, R. L., & Orvis, B. R. (1982). Enlistment effects of military educational benefits (N-1783-M). Santa Monica, CA: RAND Corporation.

Rhoads, M. D., Elig, T. W., McEntire, R. L. & Hoke, E. (1988a). The 1986/87 Army communications objectives measurement system: Supplementary tabulations of enlisted markets (ARI RP 88-05). Rockville, MD: Westat, Inc.

Rhoads, M. D., Elig, T. W., McEntire, R. L. & Hoke, E. (1988b). The 1986/87 Army communications objectives measurement system: Supplementary tabulations of officer markets (ARI RP 88-06). Rockville, MD: Westat, Inc.

Roberts, J. R., & Kocher, K. M. (1988). Recruiting and retaining Army nurses: An annotated bibliography (USAREC SR-88-6). Monterey, CA: Naval Postgraduate School.

Romanczuk, A. P., Goodstadt, B. E., Colby, C. L., & Fernandes, K. (1982). Identification of strategies for penetrating the 19- to 23-year old market (NPRDC SR 82-22). Rockville, MD: Westat Inc.

Schroyer, C. J., Gaskins, R. C., & Waters, B. K. (1987). Evaluation of 1987 new recruit survey (NRS) data (TR-FR-89-01). Alexandria, VA: Human Resources Research Organization.

Schucker, R. E. (1977a). Further analyses of the test of paid radio advertising for armed services recruitment. Volume IV. Washington, DC: J. Walter Thompson Co.

Schucker, R. E. (1977b). A media mix test of paid radio advertising for armed services recruitment. Volume III. Washington, DC: J. Walter Thompson Co.

Schucker, R. E. (1976a). A media mix test of paid radio advertising for armed services recruitment. Volume I. New York, NY: Russ Haley & Associates, Inc.

Schucker, R. E. (1976b). A media mix test of paid radio advertising for armed services recruitment. Volume II. Washington, DC: J. Walter Thompson Co.

Smith, D.A., Hogan, R., Chin, C, Goldberg, L. & Goldberg, B. (1990). Army College Fund cost-effectiveness study: Final report. Arlington, VA: Systems Research and Applications Corporation.

Sproat, K., Churchill, H., & Sheets, C. (1985). The national longitudinal surveys of labor market experience: An annotated bibliography of research. Columbus, OH: Ohio State University, Center for Human Resource Research.

Ted Bates & Company (1981). A survey of college student awareness and attitudes towards Navy officer advertising (RJ 81-4412). New York, NY: Author.

The Grey Marketing and Research Department. (1980). A study of the market potential for recruiting non-prior service females for military service. Volume 1. Washington, DC: Author.

Thomas, G. W., Kocher, K., & Roberts, B. J. (1989). 1987 U.S. Army nurse membership, accession and loss profiles: Volume II, active duty (NPS-54-89-10). Monterey, CA: Naval Postgraduate School.

Thomas, G. W., & Davis, H. (1988). USAR prior service market: A comparison of reenlistment motivations with Reserve enlistment motivations of active duty personnel (NPS-54-88-017). Monterey, CA: Naval Postgraduate School.

Thomas, G. W., Kocher, K., Moore, T. P., & Roberts, B. J. (1988). 1987 U.S. Army nurse membership, accession and loss profiles: Volume 1, Reserves (NPS-54-88-018). Monterey, CA: Naval Postgraduate School.

Warner, J. T. (1987). Interservice effects in military recruiting programs: Competition or cooperation? An analysis of Navy and Army enlistments during the period FY 1981-86. Clemson, SC: Clemson University.

Warner, J. T. (1989). Interservice effects in military recruiting programs: Cooperation or competition? Draft prepared for Western Economic Association Meetings.

Westat, Inc. (1988). The Army communications objectives measurement system (ACOMS): Parental user's manual (ARI RP 88-07). Rockville, MD: Westat, Inc.

Westat, Inc. (1986a). The 1985 Army Experience Survey: Methodology and recommendations for future administrations. Rockville, MD: Author.

Westat, Inc. (1986b). The 1985 Army Experience Survey: Data sourcebook and user's manual (ARI RP-86-01). Rockville, MD: Author.

Westat, Inc. (1986). The 1984 ARI survey of Army recruits: User's manual (ARI RN 86-46). Rockville, MD: Author.

Westat, Inc. (1986a). The 1984 ARI survey of Army recruits: Tabular description of NPS (active) Army accessions, Volumes 1 & 2. Rockville, MD: Author.

Westat, Inc. (1986b). The 1984 ARI survey of Army recruits: Tabular description of NPS Army Reserve accessions, Volumes 1 & 2. Rockville, MD: Author.

Westat, Inc. (1986c). The 1985 ARI survey of Army recruits: User's manual (ARI RN 86-50). Rockville, MD: Author.

Westat, Inc. (1987a). The 1985 ARI survey of Army recruits: Tabular description of NPS (Active) Army accessions, Volumes 1 & 2 (ARI RP-86-15). Rockville, MD: Author.



Westat, Inc. (1987b). The 1985 ARI survey of Army recruits: Tabular description of NPS Reserve accessions, Volumes 1 & 2 (ARI RP-86-18). Rockville, MD: Author.

Westat, Inc. (1987c). The 1986 ARI survey of U.S. Army recruits: Tabular descriptions of NPS (active) Army accessions, Volumes 1 & 2 (ARI RP-87-13). Rockville, MD: Author.

Westat, Inc. (1987d). The 1986 ARI survey of U.S. Army recruits: Tabular descriptions of NPS Army Reserve accessions, Volumes 1 & 2 (ARI RP-87-10). Rockville, MD: Author.

Wilson, M. J. & Perry, M. S. (1988). The career decision survey technical manual (RP-88-23). Reston, VA: PAR Government Systems Corporation.

Wilson, M. J., & Perry, M. S. (1988). The career decision survey: Modeling the Army enlistment decision (ARO TR-814). Reston, VA: PAR Government Systems Corporation.

Wood, J. R. (1986). The high school diploma for Hispanics: An exploration of meanings and implications (USAREC SR-86-13). Monterey, CA: The BDM Corporation.

Zirk, D. A., McTeigue, R. J., Wilson, M., Adelman, L., & Pliske, R. M. (1987). Alternative approaches to modeling the individual enlistment decision: A literature review (ARI TR-738). Reston, VA: PAR Government Systems Corporation.

**APPENDIX A**  
**Bibliography of Studies Reviewed**

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## I. UNDERSTANDING THE MARKET

### IA. NATIONAL LONGITUDINAL SURVEYS OF YOUTH (NLS)

1. Borus, M. E., Kim, C., & Johnson, K. (1985). Policy findings related to military service from the youth cohort of National Longitudinal Surveys of labor market experience (DMDC/SMAD TR-12). Columbus, OH: Ohio State University, Center for Human Resource Research.
2. Burk, J. S., & Faris, J. H. (1982). The persistence and importance of patriotism in the all-volunteer force (USAREC SR-82-6). Columbus, OH: Battelle Memorial Institute.
3. Center for Human Resource Research/Ohio State University. (1988). National longitudinal survey bibliography update. Columbus, OH: Author.
4. Center for Human Research/Ohio State University. (1988). The national longitudinal surveys of labor market experience (NLS) handbook. Columbus, OH: Author.
5. Daymont, T. N. & Andrisani, P. J. (1986). The economic returns to military service (USAREC SR-86-11). Philadelphia, PA: Temple University, Center for Labor and Human Resource Studies.
6. Fredland, J. E., & Little, R. D. (1982). Socioeconomic characteristics of the all-volunteer force: Evidence from the national longitudinal survey. Annapolis, MD: U. S. Naval Academy.
7. Kim, C., Nestel, G., Phillips, R. L., & Borus, M. E. (1980). The all-volunteer force: An analysis of youth participation, attrition, and reenlistment. Columbus, OH: Ohio State University, Center for Human Resource Research.
8. Kim, C. (1982a). The all-volunteer force: 1979 NLS (National Longitudinal Surveys) studies of enlistment intentions to serve, and intentions to reenlist (SMDC/SMAD TR-11). Columbus, OH: Ohio State University, Center for Human Resource Research.
9. Kim, C. (1982b). Youth and the military service: 1980 national longitudinal survey studies of enlistment, intentions to serve, reenlistment and labor market experience of veterans and attriters (DMDC/SMAD TR-10). Columbus, OH: Ohio State University, Center for Human Resource Research.
10. Kim, C. (1983). A longitudinal study of enlistment in the armed forces with special reference to the effect of intentions on behavior. Columbus, OH: Ohio State University, College of Administrative Science.
11. Nord, R. D., Schmitz, E. J., & Weiland, T. A. (1986). Propensity and the enlistment decision (ARI TR-723). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

12. Sproat, K., Churchill, H., & Sheets, C. (1985). The national longitudinal surveys of labor market experience: An annotated bibliography of research. Columbus, OH: Ohio State University, Center for Human Resource Research.

#### **IB. ARMY COMMUNICATION OBJECTIVES MEASUREMENT SURVEY (ACOMS)**

1. Elig, T. W. (1988). Targeting the delivery of Army advertisements on television (RR 1484). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
2. Elig, T. W. (1989). Advertising and (youth and parental) perceptions of the armed forces. Paper presented at the American Psychological Association 97th Annual Convention. New Orleans, LA. August 1989.
3. Gaertner, G. H. & Elig, T. W. (1988). The Army communications objectives measurements system (ACOMS): Survey analysis plan (ARI TR-786). Rockville, MD: Westat, Inc.
4. Nieva, V. F., & Elig, T. W. (1988). The Army communications objectives measurement system (ACOMS): Survey design (ARI TR-785). Rockville, MD: Westat, Inc.
5. Nieva, V. F., Rhoads, M. D. & Elig, T. W. (1988). The Army communications objectives measurement system (ACOMS): Survey methods. (ARI TR-787). Rockville, MD: Westat, Inc.
6. Nieva, V. F., Gaertner, G. H., Elig, T. W., & Benedict, M. E. (1988). The Army communications objectives measurement system (ACOMS): Annual report, school year 86/87 (ARI TR-784). Rockville, MD: Westat, Inc.
7. Rhoads, M. D., Elig, T. W., McEntire, R. L. & Hoke, E. (1988a). The 1986/87 Army communications objectives measurement system: Supplementary tabulations of enlisted markets (ARI RP-83-05). Rockville, MD: Westat, Inc.
8. Rhoads, M. D., Elig, T. W., McEntire, R. L. & Hoke, E. (1988b). The 1986/87 Army communications objectives measurement system: Supplementary tabulations of officer markets (ARI RP-88-06). Rockville, MD: Westat, Inc.
9. Westat, Inc. (1988). The Army communications objectives measurement system (ACOMS): Parental user's manual (ARI RP-88-07). Rockville, MD: Westat, Inc.

#### **IC. NEW RECRUIT SURVEYS (NRS)**

1. Benedict, M. E. (1988). A comparison of survey length with reading difficulty and selected recruit characteristics for the 1987 USAREC survey of active Army recruits (ARI RP-1475). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

2. Benedict, M. E. (1987). The 1986 ARI survey of U.S. Army recruits: Technical manual (ARI TR-735). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
3. Buddin, R. (1984). Estimation of AFEES survey weights (N-2072-MIL). Santa Monica, CA: RAND Corporation.
4. Celeste, J. F., Wilson, M. J., Ramsey, V. F., Elig, T. W., & Pliske, R. M. (1986). The 1984 and 1985 ARI survey of Army recruits: Methodology and recommendations for future administrations (TR-706). Rockville, MD: Westat, Inc.
5. Data Recognition Corporation (1987). The 1987 USAREC new recruit survey technical manual. Minneapolis, MN: Author.
6. Data Recognition Corporation. (1989). The 1988 USAREC new recruit survey technical manual. Minneapolis, MN: Author.
7. Doering, Z. D., Grissmer, D. W., & Morse, J. S. (1980). 1979 DoD survey of personnel entering military service: Wave 2 user's manual and codebook (N-1605-MRAL). Santa Monica, CA: RAND Corporation.
8. Elig, T. W., Gade, P. A., & Shields, J. L. (1982). The 1982 DA (Department of the Army) survey of personnel entering the Army. Paper presented at the meeting of Military Testing Association. San Antonio, TX. November, 1982.
9. Elig, T. W., Hertzbach, A., & Johnson, R. M. (1984). The 1982 Department of the Army survey of personnel entering the Army: Tabular description of 1983 (active) Army accessions. Volume 2 (RP-84-02). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
10. Elig, T. W., Johnson, R. M., Gade, P. A., & Hertzbach, A. (1984). The Army enlistment decision: An overview of the ARI recruit surveys, 1982 and 1983 (RR 1371). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
11. Elig, T. W., Johnson, R. M., Gade, P. A., & Hertzbach, A. (1984). 1982 Department of the Army survey of personnel entering the Army: Accessions, Volume 1 (RP-84-02). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
12. Gorman, L., & Thomas, G. W. (1989). An analysis of enlistment motivations for United States Army Reserve Recruits (MIPR 87-55). Monterey, CA: Naval Postgraduate School.
13. Gray, R. L. (1987). Influences of high quality Army enlistments. Monterey, CA: Naval Postgraduate School.
14. Hay, M. S. (1989). Sample representativeness in the new recruit surveys: Seasonality effects (TR-917). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

15. Levine, E. L. (1987). The 1986 ARI (Army Research Institute) survey of U.S. Army recruits: Survey administration (ARI RN-87-57). Triangle Park, NC: Battelle Columbus Laboratories.
16. Pliske, R. M., Elig, T. W., & Johnson, R. M. (1986). Towards an understanding of Army enlistment motivation patterns (ARI TR-702). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
17. Schroyer, C. J., Gaskins, R. C., & Waters, B. K. (1987). Evaluation of 1987 new recruit survey (NRS) data (TR-FR-89-01). Alexandria, VA: Human Resources Research Organization.
18. Westat, Inc. (1986a). The 1984 ARI survey of Army recruits: User's manual (ARI RN-86-46). Rockville, MD: Author.
19. Westat, Inc. (1986b). The 1984 ARI survey of Army recruits supplementary user's manual for October 1984/February 85 administration (ARI RN-86-47). Rockville, MD: Author.
20. Westat, Inc. (1986c). The 1984 ARI survey of Army recruits: Codebook for summer 84 active Army survey respondents (ARI RN-86-42). Rockville, MD: Author.
21. Westat, Inc. (1986d). The 1984 ARI survey of Army recruits: Codebook for summer 84 USAR and ARNG survey respondents (ARI RN-86-43). Rockville, MD: Author.
22. Westat, Inc. (1986e). The 1984 ARI survey of Army Recruits: Codebook for October 84/February 85 active Army survey respondents (ARI RN-86-44). Rockville, MD: Author.
23. Westat, Inc. (1986f). The 1984 ARI Survey of Army Recruits: Codebook for October 84/February 85 USAR and ARNG Army survey respondents (ARI RN-86-45). Rockville, MD: Author.
24. Westat, Inc. (1986g). The 1984 ARI survey of Army recruits: Tabular description of NPS (active) Army accessions, Volumes 1 & 2 (ARI RP-86-10). Rockville, MD: Author.
25. Westat, Inc. (1986h). The 1984 ARI survey of Army recruits: Tabular description of NPS Army Reserve accessions, Volumes 1 & 2 (ARI RP-86-13). Rockville, MD: Author.
26. Westat, Inc. (1986i). The 1985 ARI survey of Army recruits: User's manual (ARI RN-86-50). Rockville, MD: Author.
27. Westat, Inc. (1986j). The 1985 ARI survey of Army recruits: Codebook for summer 85 active Army survey respondents (RI-RN-86-48). Rockville, MD: Author.
28. Westat, Inc. (1986k). The 1985 ARI survey of Army recruits: Codebook for summer 85 USAR and ARNG survey respondents (ARI RN-86-49). Rockville, MD: Author.

29. Westat, Inc. (1987a). The 1985 ARI survey of Army recruits: Tabular description of NPS (Active) Army accessions, Volumes 1 & 2 (ARI RP-86-15). Rockville, MD: Author.
30. Westat, Inc. (1987b). The 1985 ARI survey of Army recruits: Tabular description of NPS Reserve accessions, Volumes 1 & 2 (ARI-RP-86-18). Rockville, MD: Author.
31. Westat, Inc. (1987c). The 1986 ARI survey of U.S. Army recruits: Codebook for active Army survey respondents (ARI RP-87-08). Rockville, MD: Author.
32. Westat, Inc. (1987d). The 1986 ARI survey of U.S. Army recruits: Codebook for Army Reserve/National Guard survey respondents (ARI RP-87-09). Rockville, MD: Author.
33. Westat, Inc. (1987e). The 1986 ARI survey of U.S. Army recruits: Tabular descriptions of NPS (active) Army accessions, Volumes 1 & 2. (ARI RP-87-13). Rockville, MD: Author.
34. Westat, Inc. (1987f). The 1986 ARI survey of U.S. Army recruits: Tabular descriptions of NPS Army Reserve accessions, Volumes 1 & 2. (ARI RP-87-10). Rockville, MD: Author.

#### ID. YOUTH ATTITUDE TRACKING SURVEY (YATS)

1. Huzar, C. E. (1988). Profiling market potential for navy recruiting at the local geographical level. NPGS Thesis. Monterey, CA: Naval Postgraduate School.
2. Lockman, R. F., & Curran, L. E. (1984). The missing link in Department of Defense recruit attainability projections (CRM 84-2). Alexandria, VA: Center for Naval Analyses.
3. Orvis, B. R. (1982). Forecasting enlistment actions from intention information: Validity and improvement (N-1954-MRAL). Santa Monica, CA: RAND Corporation.
4. Orvis, B. R. (1984). Analysis of youth cohort enlistment intention data: progress report (N-2076-MIL). Santa Monica, CA: RAND Corporation.
5. Orvis, B. R., & Gahart, M. T. (1985). Relationship of enlistment intention and market survey information to enlistment in active duty military service (N-2292-MIL). Santa Monica, CA: RAND Corporation.
6. Orvis, B. R. (1986). Relationship of enlistment intentions to enlistment in active duty services (N-2411-FMP). Santa Monica, CA: RAND Corporation.
7. Orvis, B. R., & Gahart, M. T. (1989). Quality-based analysis capability for national youth surveys (R-3675-FMP). Santa Monica, CA: RAND Corporation.



8. Orvis, B. R., Gahart, M. T., Ludwig, A. K., & Schutz, K. F. (1989). Validity and usefulness of enlistment intention information (R-3775-FMP). Santa Monica, CA: RAND Corporation.
9. Ostrove, N. M., Bray, R. M., Guess, L. L., Duntzman, G. H., & Theisen, A. C. (1988). Youth attitude tracking study II, wave 18--fall 1987. Research Triangle Park, NC: Research Triangle Institute.

#### IE. ARMY EXPERIENCE SURVEY (AES)

1. Kimmel, M. J. (1988). The Army Experience: A Good Place to Start? For publication at the American Psychological Association 96th Annual Convention. Atlanta, GA. August 12-16, 1988.
2. Westat, Inc. (1986a). The 1985 Army Experience Survey: Methodology and recommendations for future administrations. Rockville, MD: Author.
3. Westat, Inc. (1986b). The 1985 Army Experience Survey: Data sourcebook and user's manual (ARI RP-86-01). Rockville, MD: Author.
4. Westat, Inc. (1986c). The 1985 Army Experience Survey: Tabular descriptions of first-term attritees. Volume 1 (ARI RP-86-03). Rockville, MD: Author.
5. Westat, Inc. (1986d). The 1985 Army Experience Survey: Tabular descriptions of first-term attritees. Volume 2 (ARI RP-86-04). Rockville, MD: Author.
6. Westat, Inc. (1986e). The 1985 Army Experience Survey: Tabular descriptions of first-term separatees. Volume 1 (ARI RP-86-01). Rockville, MD: Author.
7. Westat, Inc. (1986f). The 1985 Army Experience Survey: Tabular descriptions of first-term separatees. Volume 2 (ARI RP-86-02). Rockville, MD: Author.

#### IF. RESERVES/OFFICER SURVEYS

1. Armstrong, T. R., Farrell, W. S., & Card, J. J. (1979). Subgroup differences in military-related perceptions and attitudes (ARI RR-1214). Palo Alto, CA: American Institutes for Research.
2. Associates for Research in Behavior Inc. (1980). Issues related to recruitment of enlisted personnel for the Reserve Components. Major findings and recommendations. 1979 tracking study. Volume I. Philadelphia, PA: Author.
3. Becerra, R. M. (1983). An assessment of college market spring-summer 1980 (DMDC/SMAD TR-15). Los Angeles, CA: California University Institute for Social Science Research.

4. Klopp, G. A. (1982). Analysis of reserve market survey (USAREC SR-82-2). Fort Sheridan, IL: U.S. Army Recruiting Command.
5. Mayas, J. B., & Smith-Waison, M. O. (1980). Male black college students: Their views of the Navy and characteristics of a Navy career (NPRDC SR-81-4). Washington, DC: Lawrence Johnson and Associates Inc.
6. Ted Bates & Company (1981). A survey of college student awareness and attitudes towards Navy officer advertising (RJ-81-4412). New York, NY: Author.

#### IG. RECRUITING SPECIFIC POPULATIONS (e.g., MINORITIES, FEMALES)

1. Borack, J. I. (1982). The intentions of men 23 to 29 years old to join the military: Results of a national survey (NPRDC-TR-82-62). San Diego, CA: Navy Personnel Research and Development Center.
2. Finnessy, M. L. (1984). Enlistment behavior and motivation: Age group comparisons (USAREC-RM-84-05). Fort Sheridan, IL: U. S. Army Recruiting Command.
3. The Grey Marketing and Research Department. (1980). A study of the market potential for recruiting non-prior service females for military service. Volume 1. Washington, DC: Author.
4. Kiplinger, V. L., Boesel, D. P., & Johnson, K. T. (1985). Propensity of young women to enlist in the military. A report to the Congress (DMDC/77MRB TR-85-4). Alexandria, VA: Defense Manpower Data Center.
5. Market Facts, Inc. (1982). A marketing study on the recruitment and retention of black-American and women cadets. Part I. Qualitative research summaries (JN-6409). Washington, DC: Author.
6. Wood, J. R. (1986). The high school diploma for Hispanics: An exploration of meanings and implications (USAREC SR-86-13). Monterey, CA: The BDM Corporation.

#### IH. INDIVIDUAL ENLISTMENT DECISION-MAKING

1. Elig, T. W., Perry, M. S., & Wilson, M. J. (1989). An expectancy theory model of initial career decisions. Prepared for the 1989 Conference of the Military Testing Association. San Antonio, TX. November 9, 1989.
2. Elig, T. W. (1989). Views of U.S. youth on military service and college enrollment as alternatives to full-time employment. Prepared for the 1989 Biennial Conference of the Inter-University Seminar on Armed Forces and Society. Baltimore, MD. October 27-29, 1989.
3. Hosek, J. R., & Peterson, C. E. (1983). The AFEES-NLS (Armed Forces Entrance and Examination Station-National Longitudinal Survey) database: A choice-based sample for studying enlistment and post-enlistment outcomes (N-1930-MRAL). Santa Monica, CA: RAND Corporation.

4. Hosek, J. R., Peterson, C. E., & Eden, R. A. (1986). Educational expectations and enlistment decisions (R-3350-FMP). Santa Monica, CA: RAND Corporation.
5. Hosek, J. R., & Peterson, C. E. (1985). Enlistment decisions of young men (R-3238-MIL). Santa Monica, CA: RAND Corporation.
6. Kralj, M. M., Adelman, L., Wilson, M., McTeigue, R. J., & Zirk, D. A. (1987) (ARI RN-87-61). Modeling the individual enlistment decision: Phase I final report. Reston, VA: PAR Government Systems Corporation.
7. McTeigue, R. J., Kralj, M. M., Adelman, L., Zirk, D. A., & Wilson, M. (1987). Predecisional processes involved in the enlistment decision. Reston, VA: PAR Government Systems Corporation.
8. Pliske, R. M., & Adelman, L. (1985). Development of tools for the measurement of enlistment decision variables (ARI 85-14). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
9. Wilson, M. J., & Perry, M. S. (1988). The career decision survey: Modeling the Army enlistment decision (ARO TR-814). Reston, VA: PAR Government Systems Corporation.
10. Wilson, M. J. & Perry, M. S. (1988). The career decision survey technical manual (RP-88-23). Reston, VA: PAR Government Systems Corporation.
11. Zirk, D. A., McTeigue, R. J., Wilson, M., Adelman, L., & Pliske, R. M. (1987). Alternative approaches to modeling the individual enlistment decision: A literature review (ARI TR-738). Reston, VA: PAR Government Systems Corporation.

#### I-I. MISCELLANEOUS PROPENSITY/INCENTIVE SURVEYS

1. Crossley Surveys Inc. (1986). Changes in the propensity to enlist over time among quality prospects (USAREC SR-86-9). New York, NY: Author.
2. Crossley Surveys Inc. (1986). Measuring advertising awareness of the New GI Bill. New York, NY: Author.
3. Fisher, A. H., Jr., & Rigg, L. S. (1974). The endorsement of enlistment incentives (CR-07-74-131). Alexandria, VA: Human Resources Research Organization.
4. J.W. Thompson (1989). United States Marine Corps awareness and image tracking research (NPS-54-88-015). Atlanta, GA: Author.
5. Kaplan, R. L., & Harris, P. T. (1983). The measurement of high school students' attitudes toward recruiting incentives (USAREC SR-83-1). McLean, VA: Rumson Corporation.
6. Kaplan, R. L., & Harris, P. T. (1986). The measurement of student attitudes toward possible recruiting incentives and career opportunities (USAREC SR-86-4). McLean, VA: Rumson Corporation.

7. Kocher, K., & Thomas, G. W. (1988). The Reserve intentions of active duty Army nurses (NPS-54-88-012). Monterey, CA: Naval Postgraduate School.
8. Roberts, J. R., & Kocher, K. M. (1988). Recruiting and retaining Army nurses: An annotated bibliography (USAREC SR-88-6). Monterey, CA: Naval Postgraduate School.
9. Thomas, G. W., & Davis, H. (1988). USAR prior service market: A comparison of reenlistment motivations with Reserve enlistment motivations of active duty personnel (NPS-54-88-017). Monterey, CA: Naval Postgraduate School.
10. Thomas, G. W., Kocher, K., Moore, T. P., & Roberts, B. J. (1988). 1987 U.S. Army nurse membership, accession and loss profiles: Volume I, Reserves (NPS-54-88-018). Monterey, CA: Naval Postgraduate School.
11. Thomas, G. W., Kocher, K., & Roberts, B. J. (1989). 1987 U.S. Army nurse membership, accession and loss profiles: Volume II, active duty (NPS-54-89-10). Monterey, CA: Naval Postgraduate School.

#### IJ. REVIEWS

1. Boesel, D. P., & Richards, J. A. (1983). Enlistment motivation in the all volunteer force environment: A review of major surveys. Alexandria, VA: Defense Manpower Data Center.
2. Doering, Z. D. (1979). Rand DoD survey research program, fiscal years 1978-79 (N-1165-MRAL). Santa Monica, CA: RAND Corporation.

## II. IDENTIFYING THE MARKET

### IA. ENLISTED SUPPLY

1. Amey, D. M., Fechter, A. E., Huck, D. F., & Midlam K. D. (1976). Econometric models of armed forces enlistment levels (OAD-CR-160). McLean VA: General Research Corp., Operations Analysis Division.
2. Angier, B., Driscoll, K., & Gregory, D. (1982). Manpower requirements derivation for the Navy comprehensive compensation and supply study (PP-385). Alexandria, VA: Center for Naval Analyses.
3. Asch, B. J. (1986). A technique for estimating the effect of pay on selected reserve supply (CRM-86-42). Alexandria, VA: Center for Naval Analyses, Naval Planning Manpower and Logistics Division.
4. Borack, J. I. (1984). A framework for integrating alternative military manpower supply methods (NPRDC TR-84-42). San Diego, CA: Navy Personnel Research and Development Center.
5. Borack, J. I. (1986). A technique for profiling the composition of the "high-quality" military market. San Diego, CA: Navy Personnel Research and Development Center.
6. Bres, E. III, Atwater, D. M., Niehaus, R. J., & Sheridan, J. A. (1981). An application of integrated human resource planning supply-demand models (RP-39). Washington, DC: Office of the Assistant Secretary of the Navy (Manpower and Reserve Affairs).
7. Buddin, R., & Witsberger, C. (1985). Reducing the Air Force male enlistment requirement: effects on recruiting prospects of the other services (R-3265-AF). Santa Monica, CA: RAND Corporation.
8. Cirie, J. A., Miller, J. J., & Sinaiko, N. W. (eds.) (1981). Department of Defense and Navy personnel supply models (TR-9). Washington, DC: Office of the Deputy Assistant Secretary of the Navy, Manpower Division.
9. Clay-Mendez, D. (1982). Documentation for the recruiting cost estimates utilized in the Navy comprehensive compensation and supply study (PP-390). Alexandria, VA: Center for Naval Analyses.
10. Cotterman, R.F. (1986). Forecasting enlistment supply: A time series of cross sections model (R-3252-FMP). Santa Monica, CA: RAND Corporation.
11. Cralley, W.E. (1979). The supply of Marine Corps recruits: A micro approach (CNS 1117). Alexandria, VA: Center for Naval Analyses.
12. Dale, C. & Gilroy, C. L. (1984). Determinants of enlistments: A macroeconomic time-series view. Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
13. Dertouzos, J. N. (1984). Enlistment supply, recruiter objectives, and the all-volunteer Army (P-7022). Santa Monica, CA: RAND Corporation.

14. Frankel, O. L., Butler, R. A., & Carpenter-Huffman, M. (1986). Army manpower cost system (ACOMS): Active enlisted force prototype (ARI TR-709). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
15. Goldberg, L. (1981). Summary of Navy enlisted supply study (CNA-PP-391). Alexandria, VA: Center for Naval Analyses, Naval Studies Group.
16. Goldberg, L. (1982). Enlisted supply: Past, present, and future. Volume 2. Appendixes A-F (CNS-1168-VOL-2). Alexandria, VA: Center for Naval Analyses, Naval Studies Group.
17. Goldberg, L. (1982). Enlisted supply: Past, present, and future. Volume 1. Executive Summary and Main Text (CNS-1168-VOL-1). Alexandria, VA: Center for Naval Analyses, Naval Studies Group.
18. Goldberg, L. (1980). Recruiters, advertising, and Navy enlistments (CNA-PP-275). Alexandria, VA: Center for Naval Analyses, Institute of Naval Studies.
19. Goldberg, L., & Goldberg, B. S. (1988). Analysis of military enlistments in the 1980s. Reston, VA: Economic Research Laboratory, Inc.
20. Goldberg, L., & Greenston, P. (1983). A time-series, cross-sectional study of enlistment supply: Army, Navy, Air Force, Marine Corps 1976-1982. Prepared for the 33rd Annual Conference of the Southern Economic Association. Washington, D.C. November 20-22, 1983.
21. Goldberg, L., & Goldberg, B. S. (1988). The enlistment supply projection model. Reston, VA: Economic Research Laboratory, Inc.
22. Horne, D. K. (1985). An economic analysis of Army enlistment supply (ARI RN-86-103). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
23. Irlam, R. E. (1984). An examination of high quality enlistees on a recruiting district level. NPGS Thesis. Monterey, CA: Naval Postgraduate School.
24. Klopp, G. A. (1981). Factors affecting U.S. Army recruiting. Fort Sheridan, IL: U.S. Army Recruiting Command Research, Studies and Evaluation.
25. Kostiuk, P. F., & Grogan, J. E. (1987). Enlistment supply into the Naval Reserve (CRM-87-239). Alexandria, VA: Center for Naval Analyses, Naval Planning Manpower and Logistics Division.
26. McNaught, W. (1981). Projecting future accessions to the Selected Reserve components (N-1563-MRAL). Santa Monica, CA: RAND Corporation.
27. Morey, R. (1980). Enlistment prediction of quality recruits: The impacts of various types of advertising, recruiters and demographics. Durham, NC: Duke University, Center for Applied Business Research.

28. Perelman, L. S. (1984). Military enlistment supply models: Purpose and progress. Paper presented at the 59th Annual Conference of the Western Economic Association International. Las Vegas, NV. June, 1984.
29. Pope, M. S., & Weideman, R. F. (1975). The effect of socio-economic factors on military enlistments in a zero-draft environment (SLSR-11-75A). Dayton, OH: Air Force Institute of Technology, Wright-Patterson Air Force Base, School of Systems and Logistics.
30. Quester, A. O., & Lockman, R. F. (1984). The all volunteer force: Outlook for the eighties and nineties (PP-433). Alexandria, VA: Center for Naval Analyses, Naval Planning Manpower and Logistics Division.
31. Serfass, P. T., Jr. (1986). A preliminary development of a nuclear propulsion officer enlistment supply model. NPGS Thesis.. Monterey, CA: Naval Postgraduate School.
32. Warner, J. T., & Goldberg, M. S. (1981). The influence of non-pecuniary factors on labor supply (PP-337). Alexandria, VA: Center for Naval Analyses.

#### IB. MARKET CONDITIONS

1. Cooke, T. W. (1988). Statistical methods for improving the assessment of recruiting market conditions. Revision (CRM-86-72.10-REV). Alexandria, VA: Center for Naval Analyses, Navy-Marine Corps Planning and Manpower Division.
2. Dale, C. (1987). Military and civilian earnings: An index number comparison (ARI TR-733). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
3. Dale, C., & Gilroy, C. L. (1983). The effects of the business cycle on the size and composition of the U.S. Army (PPRG WP-83-1). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
4. Eitelberg, M. J., Laurence, J. H., Waters, B. K., & Sellman, W. S. (1981). Subpopulation Analyses of current youth aptitudes. Alexandria, VA: Human Resource Research Organization.
5. Huck, D., & Allen, J. (1977). Sustaining volunteer enlistments in the decade ahead: The effect of declining population and unemployment (FR-CR-242). McLean, VA: General Research Corporation.
6. Kostiuik, P. F. (1989). Geographic variations in recruiting market conditions, 1976 through 1987 (CRM-89-182). Alexandria, VA: Center for Naval Analyses.
7. Lowry, C. (1988). Variations in youth earnings across Naval recruiting districts. Clemson, SC: Clemson University, Department of Economics.
8. Rhodes, G. F., Jr. (1981). Superpopulation models of labor supply and consumer expenditures (AFOSR TR-81-0664). Fort Collins, CO: Colorado State University, Department of Economics.

## IC. MARKET SEGMENTATION

1. Associates for Research in Behavior Inc. (1981). Segmentation of the non-prior service market. Reserve component attitude study 1980 (DMDC/MRB TR-80/2-SUPPL-2). Philadelphia, PA: Author.
2. Barclay, S. D. (1984). A preliminary analysis of costs and benefits of older age accessions. NPGS Thesis. Monterey, CA: Naval Postgraduate School.
3. Curtis, E. W., Borack, J. I., & Wax, S. R. (1987). Estimating the youth population qualified for military service (NPRDC TR-87-32). San Diego, CA: Navy Personnel Research and Development Center.
4. DeReu, J. A., & Robbin, J. E. (1981). Application of geodemographics to the Army recruiting problem. Arlington, VA: Claritas Corp.
5. DeTray, D. (1981). New sources of active duty military personnel: The prior service accessions pool (N-1776-MRAL). Santa Monica, CA: RAND Corporation.
6. Fernandez, L. P. (1982). The prior service accessions pool: Who are they and how do we recruit them? NPGS Thesis. Monterey, CA: Naval Postgraduate School.
7. Fernandez, J. C., & DeTray, D. (1984). Sources and characteristics of prior service accessions: Evidence from one cohort (N-2064-MIL). Santa Monica, CA: RAND Corporation.
8. Hamovitch, M. A., & Baker, M. S. (1983). Strategy for enlisting lateral entrants via computer technology (SELECT): An automated system for determining rating and pay grade qualification for potential Navy Lateral Entry Accessions (NPRDC-TR-83-33). San Diego, CA: Navy Personnel Research and Development Center.
9. Morris, S. M., (1985). Supply of quality men and women (DS-S3). Annandale, VA: Syllogistics, Inc.
10. Reese, D. A. (1986). User's guide to the Claritas zip code data set (CRM-86-263). Alexandria, VA: Center for Naval Analyses.
11. Sahai, H. (1984). Geographic and demographic distribution of aptitude scores of the 1980 high school seniors (USAREC RM-84-1). Alexandria, VA: U. S. Army Deputy Chief of Staff for Personnel.
12. Shavelson, R. J., Haggstrom, G. W., & Blaschke, T. J. (1984). Two-year colleges and vocational schools as sources of military manpower (N-2193-MIL). Santa Monica, CA: RAND Corporation.
13. Shavelson, R. J., Haggstrom, G. W., & Winkler, J. D. (1983). Potential for military recruiting from two-year colleges and postsecondary vocational schools (N-1946-MRAL). Santa Monica, CA: RAND Corporation.



14. Stephenson, S. P., Jr., Beik, L. L., Ellison, D. R., & Fitch, S. D. (1983). Profile of prior-service accessions to the U.S. (United States) Navy: Fiscal years 1973-1981 (TR-83-1-ONR). University Park, PA: Pennsylvania State University Institute for Policy Research and Evaluation.
15. Suffa, F. W. (1984). Educational attainment and mental ability of the manpower pool (GRC-PSO-84-1317-46). McLean, VA: General Research Corporation.
16. Synectics for Management Decisions, Inc. (1989). A planning study to identify information sources on the availability of health care professionals. Arlington, VA: Authors.
17. Wood, J. (1986). Hispanics and the military: A reference data base (USAREC RM-86-1). Monterey, CA: BDM Corporation.
18. Zimmerman, R. A. & Zimmerman, D. C. (1985). Recruitment of college-bound youth through use of the ACT assessment file (USAREC SR-85-1). Monterey, CA: Naval Postgraduate School.

#### ID. GOAL ALLOCATION

1. Daula, T. V., & Smith, D. A. (1984). Recruiting goals, enlistment supply and enlistment in the U.S. Army. Presented at the U.S. Army Manpower Economics Conference. Williamsburg, VA. December, 1984.
2. Morey, R. C. (1982). The tactical allocation of quality recruiting goals across regions and districts: Its use in identifying "exceptional" producers. Durham, NC: Duke University, Center for Applied Business Research.
3. Morey, R. C. (1982). Confidence intervals and validation of a forcaster of quality Navy enlistments (ONR-200-6). Durham, NC: Duke University, Center for Applied Business Research.

### III. INFLUENCING THE MARKET

#### IIIA-1. SERVICE-SPECIFIC ADVERTISING

1. Ashbury, J. (1988). Four years of media habits: Implications for U.S. Army advertising to the prime market (ARI-RR-1500). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
2. Elig, T. W., Weltin, M. M., Hertzbach, A., Johnson, R. M., & Gade, P. A. (1985). U.S. Army advertising from the recruits' viewpoint (ARI RR-1407). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
3. Elig, T. (1988). Targeting the delivery of army advertisements on television (ARI-TR-1484). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
4. Fernandes, K., Romanczuk, A. P., Goodstadt, B. E., & Colby, C. L. (1983). Evaluation of a tailored direct-mail marketing strategy for recruiting the 19- to 23-year-old market (NPRDC SR-83-38). Rockville, MD: Westat, Inc.
5. Gilkey, P. E. (1986). The Army's GI Bill advertising awareness survey: A discriminant analysis (USAREC-RM-86-2). Fort Sheridan, IL: U. S. Army Recruiting Command.
6. Klopp, G. (1986). Comparison of media inflation and Army recruiting advertising expenditures. (USAREC SR-86-1). Washington, DC: U. S. Army Chief of Staff for Personnel.
7. Morey, R. C. (1982). Comparison of the marginal cost-effectiveness of various recruiting resources for high school graduate enlistments: Analyses of national, local and "walk-in" leads and yield rates (ONR-200-7). Durham, NC: Duke University, Center for Applied Business Research.
8. Schucker, R. E. (1976a). A media mix test of paid radio advertising for armed services recruitment. Volume I. New York, NY: Russ Haley & Associates, Inc.
9. Schucker, R. E. (1976b). A media mix test of paid radio advertising for armed services recruitment. Volume II. Washington, DC: J. Walter Thompson Co.
10. Schucker, R. E. (1977a). Further analyses of the test of paid radio advertising for armed services recruitment. Volume IV. Washington, DC: J. Walter Thompson Co.
11. Schucker, R. E. (1977b). A media mix test of paid radio advertising for armed services recruitment. Volume III. Washington, DC: J. Walter Thompson Co.

### IIIA-2. JOINT SERVICE ADVERTISING AND COMPARISONS

1. CACI, (1984). Alternatives to the current level and mix of enlisted, active force recruiting advertising. Arlington, VA: Author.
2. Carroll, V. P. (1987). Department of Defense advertising mix test. Comparison of Joint-Service with Service-specific strategies and levels of funding. Philadelphia, PA: Wharton Applied Research Center.
3. Charnes, A., Cooper, W. W., & Galony, B. (1986). Relative effects by data envelopment analysis of Service-specific and Joint national advertising in recruiting activities. Austin, TX: Texas University Center for Cybernetic Studies.
4. Charnes, A., Cooper, W. W., Galony, B., & Brockett, P. (1986). Critique of FY 1984 advertising mix test of Wharton Center for Applied Research (CCS RR-546). Austin, TX: Texas University Center for Cybernetic Studies.
5. Dertouzous, J. N. (1989). The effects of military advertising: Evidence from the advertising mix test (N-2907-FMP). Santa Monica, CA: RAND Corporation.
6. Grey Advertising Inc. (1979). Joint service magazine advertising test. Spring 1978. New York, NY: Author.
7. Koenig, R. F., Jr. (1984). Advertising strategies: corporate and product-specific (ACSC-84-1475). Maxwell Air Force Base, AL: Air Command and Staff College.
8. Morey, R. C. (1984). Joint DoD versus Navy specific lead generation advertising: Comparison of conversion rates to quality enlistments and marginal costs (TR-389-1-ONR). Durham, NC: Duke University, Center for Applied Business Research.
9. Morey, R. C. (1983). Leads and quality enlistments: The relative impacts of Joint and Navy specific advertising on production of upper mental, HSDG (high school degree graduate), male, Navy enlistments (ONR-200-9). Durham, NC: Duke University, Center for Applied Business Research.

### IIIB. RECRUITER PRODUCTIVITY

1. Carroll, V. P. (1982). The Navy enlistment field marketing experiment. Volume III. An empirical investigation of Navy recruiter productivity (TR-3). Philadelphia, PA: Wharton Applied Research Center.
2. Cooke, T. W. (1986). Individual incentives in Navy recruiting (CRM-86-269). Alexandria, VA: Center for Naval Analyses, Naval Planning, Manpower, and Logistics Division.

3. Fernandes, K. (1983). Evaluation of the Navy's recruiting assistance program as a peer networking strategy for recruiting the 19-to 23-year old market (NPRDC-SR-83-11). San Diego, CA: Navy Personnel Research and Development Center.
4. Fetko, L. L. (1985). Attitudes toward the hometown recruiter assistance program: A discriminant analysis (USAREC RM-85-01). Fort Sheridan, IL: U. S. Army Recruiting Command.
5. Hertzbach, A., Elig, T. W., Gade, P. A., Siebold, G. L. Eaton, N. K., & O'Hara, J. W. Assessment of the hometown recruiter assistance program. Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.

#### IIIC. ENLISTMENT INCENTIVES (BONUSES, GI BILL, etc.)

1. Barfoot, C. B., Sims, W. H., & Klein, S. W. (1975). Marine Corps enlistment guarantee study. (CNS 1056). Arlington, VA: Center for Naval Analyses, Marine Corps Operation Analysis Group.
2. Fernandez, R. L. (1980). Issues in the use of postservice educational benefits as enlistment incentives (N-1510-MRAL). Santa Monica, CA: RAND Corporation.
3. Fernandez, R. L. (1982). Enlistment effects and policy implications of the educational assistance test program (R-2935-MRAL). Santa Monica, CA: RAND Corporation.
4. Glickman, A. S., Korman, A. K., Goodstadt, B. E., Frey, R. L., & Romanczuk, A. P. (1973). A study of experimental incentives as an influence on enlistment intention. (IR-32201-12/73-TM-2). Silver Spring, MD: American Institutes for Research.
5. Haggstrom, G. W., Blaschke, T. J., Chow, W. K., & Lisowski, W. (1981). The multiple option recruiting experiment (R-2671-MRAL). Santa Monica, CA: RAND Corporation.
6. Horne, D. K., Pliske, R. M., & Gilroy, C. L. (1988). The Army 2-year enlistment option: Measuring its cost-effectiveness (ARI TR-790). Alexandria, VA: U. S. Army Research Institute for the Behavioral and Social Sciences.
7. Huck, D. F., Midlam, K. D., Arms, R. L., Maloney, M. J., & Mulrooney, C. F. (1976). An evaluation of the effectiveness of the US Army enlistment bonus volume 1 (OAD-CR-154). McLean, VA: General Research Corp, Operations Analysis Division.
8. Joy, J. R. (1979). New incentives for enlistment in the all-volunteer force. Carlisle Barracks, PA: Carlisle, PA: U. S. Army War College.
9. Klopp, G. A. (1982). USAR enlistment incentives analysis (USAREC SR-82-3). Fort Sheridan, IL: U.S. Army Recruiting Command.

10. Palomba, C. A. (1983). U.S. Marine Corps enlistment bonus program (CNR-34). Alexandria, VA: Center for Naval Analyses, Marine Corps Operations Analysis Group.
11. Phillips, R. L. (1986). A critical element of Army recruiting strategy. An affordable G.I. Bill (USAREC SR-86-5). Fort Sheridan, IL: U. S. Army Recruiting Command.
12. Polich, J. M., Fernandez, R. L., & Orvis, B. R. (1982). Enlistment effects of military educational benefits (N-1783-M). Santa Monica, CA: RAND Corporation.

#### IIID-1. PRODUCTION MIX

1. Carroll, V. P., & Rao, A. G. (1982). The Navy enlistment field marketing experiment. Volume I.: Executive overview and summary (TR-1). Philadelphia, PA: Wharton Applied Research Center.
2. Romanczuk, A. P., Goodstadt, B. E., Colby, C. L., & Fernandes, K. (1982). Identification of strategies for penetrating the 19- to 23-year old market (NPRDC-SR-82-22). Rockville, MD: Westat Inc.
3. Warner, J. T. (1987). Interservice effects in military recruiting programs: Competition or cooperation? An analysis of Navy and Army enlistments during the period FY 1981-86. Clemson, SC: Clemson University.
4. Warner, J. T. (1989). Interservice effects in military recruiting programs: Cooperation or competition? Draft prepared for Western Economic Association Meetings.

#### IIID-2. RESOURCE ALLOCATION

1. Cooke, T. W. (1968). Recruiting resources and policies (CRM-88-27). Alexandria, VA: Center for Naval Analyses, Navy-Marine Corps Planning and Manpower Division.
2. Morey, R. C. (1978). Overview of Duke University's efforts to optimize advertising and recruiter expenditures. Durham, NC: Duke University, Center for Applied Business Research.
3. Morey, R. C., & McCann, C. (1979). Budget allocation and enlistment prediction models for the Navy's recruiting command: The proper balance between recruiters and advertising efforts. Durham, NC: Duke University, Center for Applied Business Research.
4. Morey, R. C. (1980). The impacts of various types of advertising media, demographics, and recruiters on quality enlistments: Results from simultaneous and heteroscedastic models (TR-N-1). Durham, NC: Duke University, Center for Applied Business Research.

5. Morey, R. C. (1982). Management of the armed services' delayed entry pools: A comparison of recruiting philosophies and issues (ONR-200-9). Durham, NC: Duke University, Center for Applied Business Research.
6. Morey, R. C. (1983). Estimating differences in area-level impacts of various recruiting resources: Can different recruiting areas and years be pooled? (ONR-200-10). Durham, NC: Duke University, Center for Applied Business Research.
7. Morey, R. C. (1985). Trading off recruiter field level support versus advertising: A budget building model incorporating optimized recruiter allocation and contract goaling (ONR-389-2). Durham, NC: Duke University, Center for Applied Business Research.
8. Morey, R. C., & Lovell, C. A., (1986). A prototype model for allocating Army enlistment incentives: A feasibility phase (USAREC SR-86-3). Alexandria, VA: Defense Logistics Agency, Battelle Columbus Laboratories.
9. Morey, R. C. (1987). Impacts of size, composition and compactness of the delayed pool on enlistment contract production: Efficient allocation of recruiting expenditures and optimal DEP management. Cincinnati, OH: University of Cincinnati, Center for Applied Business Research.
10. Morey, R. C. (1989). Costing out quality changes: An empirical analysis of U.S. Navy enlistments. Cincinnati, OH: University of Cincinnati.

#### IIIE. SURVEYS

1. Carroll, V. P., Lee, H. L., Lipson, D. P., & Rao, A. G. (1982). The Navy enlistment field marketing experiment. Volume V. The Wharton-administered Navy tracking survey: Pre-intervention recruiting environment (TR-5). Philadelphia, PA: Wharton Applied Research Center.
2. Carroll, V. P., Bayus, B. L., Lee, H. L., & Rao, A. G. (1982). The Navy enlistment field marketing experiment. Volume VII. The Wharton administered Navy tracking survey: A segmentation approach (TR-7). Philadelphia, PA: Wharton Applied Research Center.
3. Hosek, J. R., & Peterson, C. E. (1990). Serving her country: An analysis of women's enlistment (R-3853-FMP). Santa Monica, CA: RAND Corporation.

## APPENDIX B

### Chronology of YATS: Contents & Focus

Adapted from Youth Attitudes Tracking Study:  
Historical Evolution and Characteristics,  
by Michael Laurence and Sue Bridges, 1985

# **The Chronology of the Youth Attitude Tracking Study (YATS)**

<u>Wave</u>	<u>Date</u>	<u>Males</u>		<u>Females</u>		<u>Collection Period</u>
		<u>16-21</u>	<u>22-29</u>	<u>16-21</u>	<u>22-24</u>	
1	Fall 1975	3,167	0	0	0	10/27 - 11/29/75
2	Spring 1976	3,008	0	0	0	4/22 - 5/17/76
3	Fall 1976	5,475	0	0	0	10/19 - 11/30/76
4	Spring 1977	5,520	0	0	0	4/11 - 5/28/77
5	Fall 1977	5,280	0	0	0	10/18 - 11/27/77
6	Spring 1978	4,006	0	0	0	1/1 - 6/15/78
7	Fall 1978	5,199	0	0	0	10/6 - 12/8/78
8	Spring 1979	5,203	0	0	0	4/15 - 5/27/79
9	Fall 1979	5,187	0	0	0	10/1 - 11/9/79
10	Spring 1980	5,217	0	0	0	3/31 - 5/9/80
11	Fall 1980	5,111	0	5,252	0	10/17 - 12/10/80
12	Fall 1981	5,201	0	5,213	0	10/21 - 12/16/81
13	Fall 1982	5,993	0	1,251	0	9/20 - 11/7/82

## **YATS II**

14	Fall 1983	4,948	1,153	1,313	0	9/12 - 12/21/83
15	Fall 1984	5,058	1,379	1,503	0	8/1 - 9/30/84
16	Fall 1985	5,478	1,180	3,301	0	7/22 - 11/27/85

## **[22-24]**

17	Fall 1986	5,382	1,068	3,191	1,102	7/26- 11/12/86
18	Fall 1987	5,642	1,103	3,448	1,078	7/26- 11/3/87
19	Fall 1988	5,486	1,130	3,271	1,098	7/24- 11/10/88

## **Wave 1, 1975: (34 day collection)**

- Sample characteristics: males aged 16 to 21 years, who have never served in the military and are not currently accepted for military service.
- Sampling method: Random Digit Dial (RDD) telephone. No details offered as to whether this was truly random or whether special procedures were used to improve efficiency.
- Sampling strata: 200 respondents in each of 13 tracking areas plus 400 from the balance of the country.
- Weighting: Individual weight = Percentage of total estimated military available in each of 156 cells (13 tracking areas X 6 ages X 2 races) divided by a percentage of total respondents in each cell.

## **Wave 2, 1976 (Spring): (26 day collection)**

- Same as Wave 1, on all dimensions.

## **Wave 3, 1976 (Fall): (43 day collection)**

- Sample characteristics: Same as Wave 1.
- Sampling method: Same as Wave 1.
- Sampling strata: 200 respondents in each of 26 tracking Areas.



- Weighting: Individual weight = Tracking area weight (Percentage of total estimated military available in each tracking area divided by a percentage of total respondents in each tracking area) X Age/Race weight (Percentage of total estimated military available for each of 12 Age/Race cells divided by percentage of total respondents in each Age/Race cell).

**Wave 4, 1977 (Spring):** (48 day collection)

- Sample characteristics: Same as Wave 1.
- Sampling method: Same as Wave 1.
- Sampling strata: Same as Wave 3.
- Weighting: Same as Wave 3.

**Wave 5, 1977 (Fall):** (40 day collection)

- Sample characteristics: Same as Wave 1.
- Sampling method: True RDD with telephone numbers generated from seed numbers.
- Sampling strata: Same as Wave 3.
- Weighting: Same as Wave 3.

**Wave 6, 1978 (Spring):** (166 day collection)

- Sample characteristics: Same as Wave 1.
- Sampling method: Same as Wave 5.
- Sampling strata: Same as Wave 3.
- Weighting: Same as Wave 3.

**Wave 7, 1978 (Fall):** (63 day collection)

- Sample characteristics: Same as Wave 1.
- Sampling method: Same as Wave 5.
- Sampling strata: Same as Wave 3.
- Weighting: Same as Wave 3.

**Wave 8, 1979 (Spring)** (42 day collection)

- Sample characteristics: Same as Wave 1.
- Sampling method: Same as Wave 5.
- Sampling strata: Same as Wave 3.
- Weighting: Same as Wave 3.

**Wave 9, 1979 (Fall):** (39 day collection)

- Sample characteristics: Same as Wave 1.
- Sampling method: Same as Wave 5.
- Sampling strata: Same as Wave 3.
- Weighting: Same as Wave 3.

Wave 10, 1980 (Spring): (39 day collection)

- Sample characteristics: Same as Wave 1.
- Sampling method: Same as Wave 5.
- Sampling strata: Same as Wave 3.
- Weighting: Same as Wave 3.

Wave 11, 1980 (Fall): (54 day collection)

- Sample characteristics:
  - Males aged 16 to 21 years
  - Females aged 16 to 21 years
  - Who have never served in the military or not currently accepted for military service.
- Sampling method: Same as Wave 5.
- Sampling strata: same as Wave 3.
- Weighting: Household population estimates projected from the 1970 Census substituted for estimated military available in the formula used for Wave 3.

Wave 12, 1981 (Fall): (65 day collection)

- Sample characteristics: Same as Wave 11.
- Sampling method: Same as Wave 5.
- Sampling strata: Same as Wave 3.
- Weighting: Same as Wave 11.

Wave 13, 1982 (Fall): (48 day collection)

- Sample characteristics: Same as Wave 11.
  - The 1,251 female interviews in this wave represent a much smaller sample than the two previous years.
- Sampling method: RDD using the Waksburg/Mitofsky method. This is a two stage process. In the first stage, calls are made to randomly selected telephone exchanges. Exchanges that provide a household on the first number called are designated as clusters. In the second stage, numbers are generated within the designated clusters to find additional households. The sample size was determined by the number of young males needed (the market of primary interest). In the end, all young males identified were used in the sample, females and older males were sampled from a subset of the total sample.
- Sampling strata: MEPS (military entrance processing stations) were used instead of tracking areas. MEPS provide standardized units, and are uniform across the Services. Ninety males were drawn from each of 66 MEPS; the national female sample was drawn by state in proportion to state population.
- Weighting: The sample of males was weighted to reflect the age and racial characteristics of the total U.S. male population (weighting was derived from 1980 Census results). Therefore, it was possible to make inferences about the propensity of separate racial and age groups to serve in the military.
- Individuals were also compared on the basis of their current employment status.

## YATS II

Wave 14, 1983 (Fall): (100 collection days)

- Sample characteristics:
  - males aged 16 to 21 years
  - males aged 22 to 29 years
  - females aged 16 to 21 years
  - could have completed no more than two years of college.
  - who reside in households or noninstitutional group residences with telephones in the continental United States.
  - who have never served in the military or not currently accepted for military service.
  - College ROTC considered military service and made one ineligible to respond. High school ROTC not considered military service.
  - individuals were also analyzed and compared on the basis of their current employment status.
- Sampling method:
  - Random Digit Dialing (RDD) using the Waksburg/Mitofsky method. CATI Used for the first time. The different sample sizes needed for each of the three subgroups were obtained by randomly assigning the clusters in the total sample to one of three waves. Interviews were collected from clusters in the first wave for all three groups, females and younger male interviews only in the second wave and younger male interviews only in the third wave.
- Sampling strata:
  - MEPS (military entrance processing stations) are used. Households were selected within each of the 66 MEPS in the continental U.S.
- Weighting:
  - the sample of males was weighted to reflect the age and racial characteristics of the total U.S. male population (weighting was derived from 1980 Census results). Therefore, it was possible to make inferences about the propensity of separate racial and age groups to serve in the military.

### New analyses:

- Exploratory multivariate analyses were conducted that examined the effects of a set of variables on propensity to join the Services.
- A market segmentation analysis identified five Recruiting Priority Groups on the basis of educational status and average grades earned in high school. These groups were developed for use by recruiters. Five RPGs for young males were defined by educational status and average grades in high school.

#### Questionnaire differences:

- Two series of surveys were combined, YATS and RCAS (the Reserve Component Attitude Study). RCAS began in 1977 to measure the intentions of young adults (17 to 26 year old males and females) to join the Reserves. Prior to this wave, YATS included general propensity questions about ones' interest in serving in the Active Service or Reserves, with more specific questions about pay and benefits in the Active Service. This wave added more specific knowledge questions about pay and benefits and specific interest in the Reserves.
- The Lebanon and Grenada incidents occurred during this wave. To study the effects of these events, the responses from interviews before each incident were compared with the responses after that incident. (No effect was found). In addition, a comparison was made of a subsample who were interviewed before a given event and reinterviewed after the event ( A positive effect was found).
- Because the male age group expanded to include 22-29 year olds, education options are expanded as well. However, an interview was still terminated if an individual had completed two years of college.
- Asks for specific information on wages, the number of jobs, job duties, and number of hours worked.
- Introduces random sequencing of multiple questions (example c-18) but reduces answer options from 4 to 2.
- Adds more specific questions about the Guard and Reserves. For example, previous surveys had asked propensity to join, this survey asks propensity, as well as probes how much they know about pay, bonuses, training requirements and advertising for the Guard and Reserves.
- Adds section on youths' awareness of advertising, by Service.
- Introduces questions about attitude toward one year of mandatory service for all young men and women and attitude toward increasing taxes to support such a program.
- Adds specific questions about the affect of the bombing in Lebanon and military action in Grenada on enlistment decision.
- Adds three questions on availability of computerized career information systems within the schools and if such a system includes military career information.

#### Wave 15, 1984 (Fall): (61 collection days)

- Sample characteristics: Same as Wave 14.
  - The 5,058 young males represent 1,836 callback interviews from the 1983 YATS survey and 3,222 interviews from a "new" sample selected in June 1984.
- Sampling method: same as Wave 14. A small number of interviews were randomly replicated in clusters where all 100 possible numbers were called but the required number of households specified by the sampling design were not obtained.
- Sampling strata and weighting scheme the same as Wave 14.

#### Questionnaire Differences: basically the same questionnaire.

- Questions added asking respondents to identify advertising slogans associated with the four Services.
- Straight-forward question added asking what an individual is most likely to be doing next year.

- Questions added regarding propensity to volunteer for an "Individual Ready Reserve."
- Questions dropped asking if a recruiter referred an individual to a recruiter in another Service.
- Added questions about how people "feel" about Service.

Wave 16, 1985 (Fall): (133 day collection)

- Sample characteristics: Same as Wave 15, except for call-backs.
- Sampling method: Same as Wave 15.
- Sampling strata: Same as Wave 14
- Weighting: Unable to identify any differences from Wave 14.

Questionnaire differences:

- More detailed skip patterns introduced.
- Questions 551-562 apply only to active duty service and were asked of all respondents. Questions 571-583 apply only to service in the Reserves and were asked of all older males and females but only half of the young males.
- Dropped a series of questions regarding an individual's current work habits (e.g. hours worked, amount of time looking for work, number of jobs working, job starting date...)

Wave 17, 1986 (Fall): (112 day collection)

- Sample characteristics:
  - males aged 16 to 21 years
  - males aged 22 to 24 years
  - females aged 16 to 21 years
  - females aged 22 to 24 years
  - who reside in households or noninstitutional group residences with telephones in the continental United States.
  - could have completed no more than two years of college.
  - who have never served in the military or not currently accepted for military service.
  - College ROTC considered military service and made one ineligible to respond. High school ROTC not considered military service.
- Sampling method: Same as Wave 15.
- Sampling strata: Same as Wave 14.
- Weighting: Unable to identify any differences from Wave 14.

New analyses:

- The use of full scale multivariate (regression) analyses to increase understanding of the contribution made by combinations of variables in predicting propensity for the younger market groups.
- An expanded treatment of the effect of economic conditions on propensity for young males and young females utilizing average local unemployment rates and self-reported employment status.
- A new market segmentation approach, for young males and young females (based on high school status and predicted AFQT scores) which replaces the recruiting priority groups used in 1984 and 1985 analyses.

Wave 18, 1987 (Fall): (105 day collection)

- Sample characteristics: Same as Wave 17.
- Sampling method: Same as Wave 15.
- Sampling strata: Same as Wave 14.
- Weighting: Unable to identify any differences from Wave 14.

Wave 19, 1988 (Fall): (110 day collection)

- Sample characteristics: Same as Wave 17.
- Sampling method: Same as Wave 15.
- Sampling strata: Same as Wave 14.
- Weighting: Unable to identify any differences from Wave 14.

Questionnaire differences:

- Added items focus on respondents' participation in selected military events (e.g. band concert, firepower drill, parade, visit to a ship) and attitudes about a national service program. Selected items about family composition that were in the 1987 questionnaire were deleted in this version.

**END  
FILMED**

DATE: *2-92*

**DTIC**